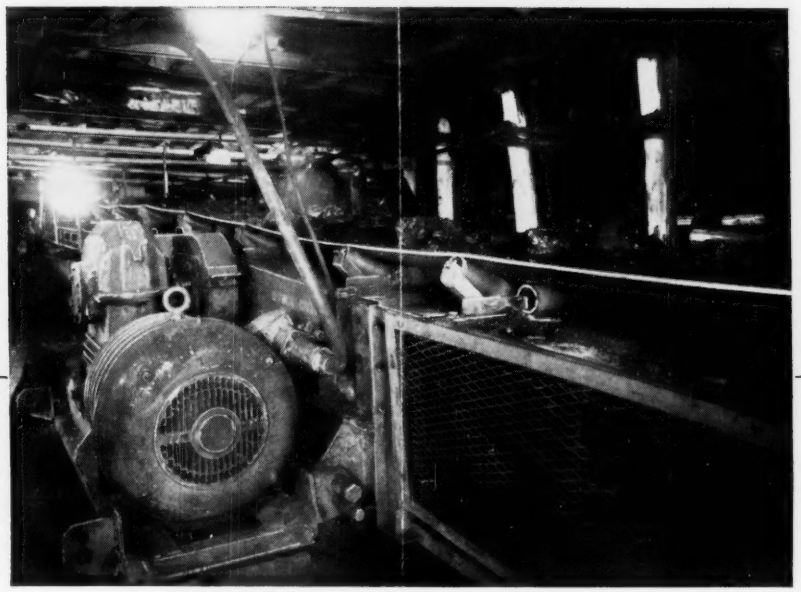
The Mining Journal

Established 1835 — Railway & Commercial Gazette

Vol. CCXLIII No. 6208 — LONDON, AUGUST 13, 1954 — PRICE 8d.

Flameproof colliery motors



'ENGLISH ELECTRIC' flameproof colliery motors have been developed to meet the requirements of mining engineers for medium-sized motors of exceptionally strong construction. In all stages of the design, consideration has been given to the robustness and durability needed to withstand the most arduous colliery conditions.

The illustration shows an 'ENGLISH ELECTRIC' 40 h.p. 960 r.p.m. 500 volt, 3-phase, 50 cycle, flameproof motor driving a Distington-Goodman type 30" troughed belt conveyor through reduction gears.

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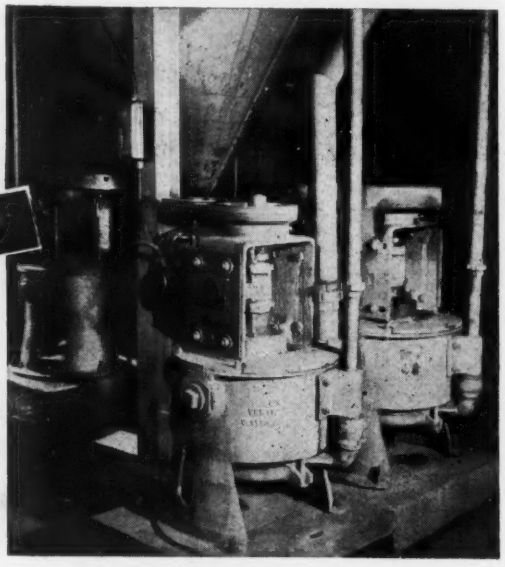
DENVER vertical SAND PUMP



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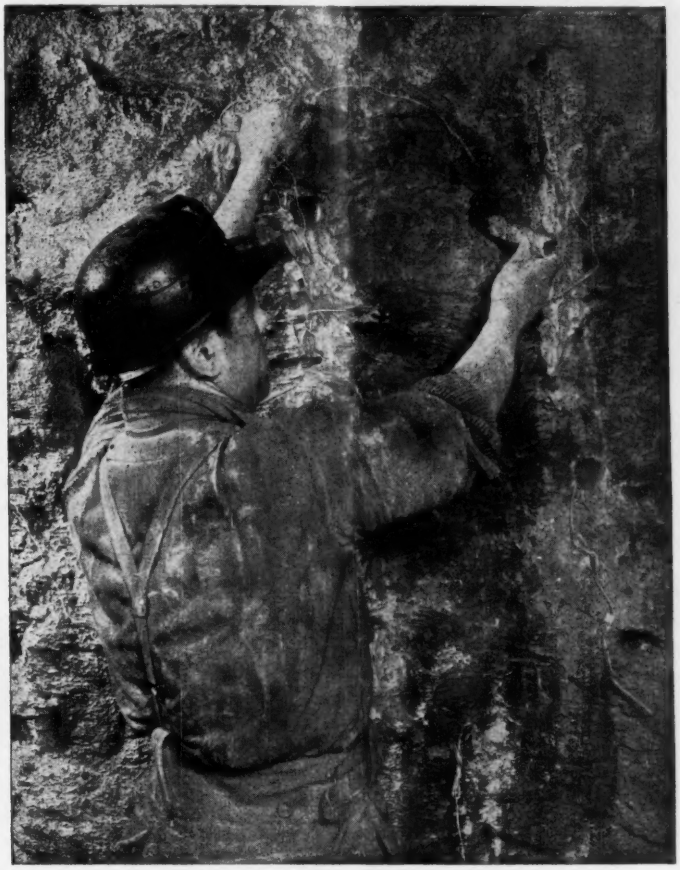

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N.44A

This is NEWS!

CERTIFIED FLP FLAMEPROOF
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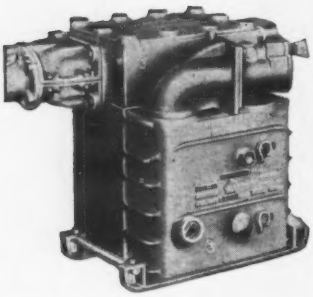
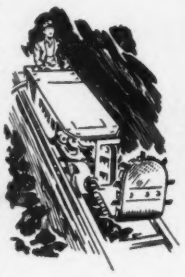
BOLTLESS PANELS
to N.C.B. Specification

Type BCC.10 Coal Cutter or Conveyor Panel

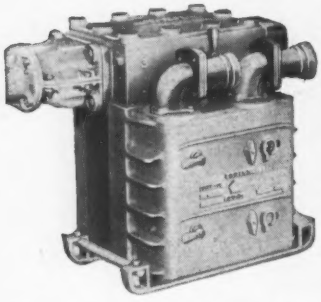


Generously-rated 3-phase contactor, tested to 600 amps. at 0.4 power factor on 100 operations at three seconds' intervals.
Isolator and contactor mechanically and electrically interlocked.
Pilot circuit to latest intrinsically safe requirements.
Three outlets for interlocking and control circuits plugged in power unit assembly.
Instruments fitted if required.
Earth leakage protection and test circuit.
Pluggable type overload assemblies.



Specification P3/1950

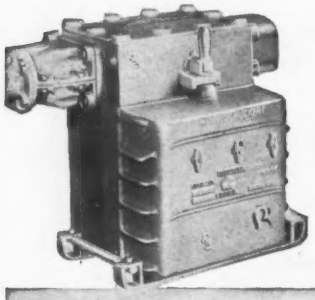
Type BDT.10 Double Unit Drill Panel



Pilot circuit on each of two drill circuits to latest intrinsically safe requirements.
Earth leakage protection independent for each circuit and fitted with indication and test circuits.
Overloads of normal and short circuit capacity fitted as desired by Ministry of Fuel and Power.
Whole control unit pluggable design.

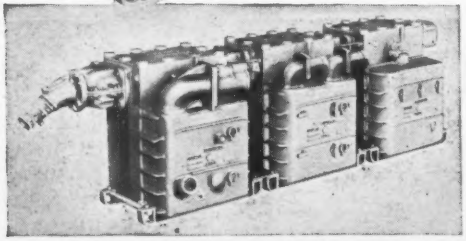
Specification P9/1950

Type BLT.10 Lighting Panel



K.V.A. rating up to 4½ K.V.A. single-phase.
Lining-up features with other makes of N.C.B. Panel.
H.R.C. fuse-switch protection for out-going circuits for normal overload and short circuit conditions.
Three circuit outlets available.

Specification P8/1950



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Overall height	26"
Width of tank	21¼"
Depth of tank	19⅜"

100 Amp and 30 Amp 4-pin restrained and bolted plug socket assemblies available.

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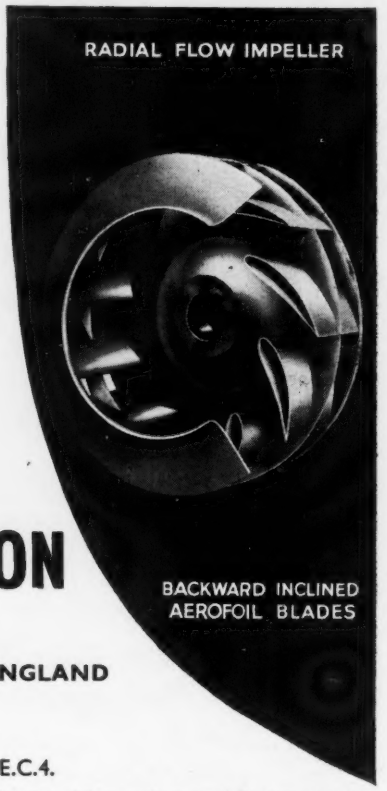

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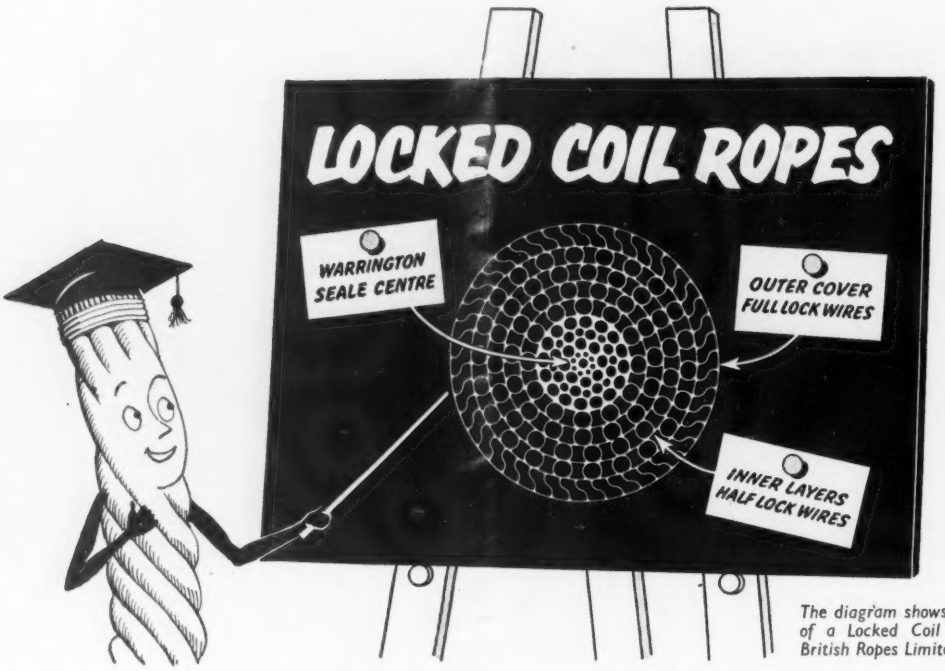
LEARNING THE ROPES



The diagram shows the end section of a Locked Coil rope made by British Ropes Limited.

LOCKED COIL ROPES are constructed with one or more covers of interlocking wires. Their main advantages can be summarised as follows:—

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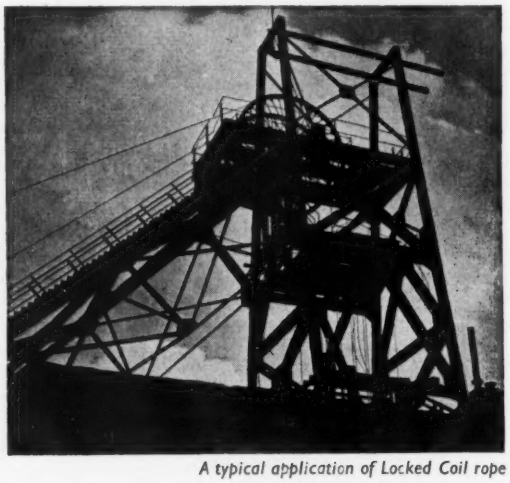
Locked Coil Ropes can be conveniently divided into the following groups:

a: Ropes designed for winding, sinking and engineering purposes.

b: Ropes designed for pit head guides and rubbing ropes.

c: Ropes designed for aerial ropeways; Blondins and Cableways.



A typical application of Locked Coil rope

BRITISH ROPES LIMITED

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The Mining Journal

Established 1835

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CONTENTS

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NOTES AND COMMENTS

U.S. Coal Industry in Difficulties

The sense of urgency which surrounds the United Kingdom coal mining industry and is reflected in the almost weekly exhortations to miners to reduce absenteeism and increase output stands in strange contrast to the situation prevailing in the coal mining industry in the United States where coal production is currently running at the lowest level since the days of the great depression of the early 1930's.

Indeed several mines have closed, many miners are unemployed or on short time, some companies are only just managing to keep their heads above water, and investment capital has not been forthcoming for what has been long considered an attractive enterprise. Nor does a statistical presentation of the current situation make more interesting reading. Bituminous production, which reached a peak figure in 1947 with an output of over 630,000,000 tons, has shown fairly gradual decline to 450,000,000 tons last year—a figure well below the average annual output during the decade prior to the great depression years. This year production is running at the rate of 360,000,000 tons, while exports have also been reduced. At the end of April last the *American Metal Market* stated that they amounted to 6,600,000 tons as against 8,500,000 tons in the comparable period of 1953.

The reasons for the present serious ills besetting the industry are not far to seek. In the early part of the century coal was directly responsible for about 90 per cent of the energy consumed in the United States, whereas to-day the figure is less than 30 per cent. The railroads, which at one time took more than 130,000,000 tons per year has cut its consumption to approximately 25,000,000 tons, indicative of the inroads made by " dieselization " and reflecting the trend followed by the U.S. industry in general which is consuming more oil and natural gas in preference to coal.

The outlook, however, is not altogether black. The expansion of the U.S. steel industry carries with it the promise of increased coal consumption and a similar increase in the demand for coal can be looked for as the electric utilities achieve their increased capacity. In the longer run, it is possible that the widespread adoption of new methods for the refining of metals by the Sheer-Korman arc or consumable electrode techniques will bring about the re-siting of metal plants close to coal mines. Since the Sheer-Korman techniques are also applicable to other metals, particularly aluminium, magnesium, beryllium, and lithium, the scope for the increased consumption, should this eventuate, would be considerable. There is, too, the recognizedly great potential future for coal in the production of chemicals, synthetic fuel, and explosives, so that one way or another the present bleak outlook in no way heralds the gradual demise of this great industry.

Nevertheless, it is the current situation, involving as it has a reduction in employment from about 700,000 to approximately 260,000 in a short span of year, which is causing serious concern, alike to the industry and to the government. The gravity of the situation, in so far as the coal mining industry is concerned, can be measured fairly accurately by the fact that even John L. Lewis, President of the United Mine Workers, had to forego his usual spring wage demand which were often accompanied by a strike. In its place he appealed to the government for a fuel policy to ameliorate the present situation. The government for their part has appointed a committee to study the industry in relation to defence and remedial measures, and the report of the six-man survey team appointed to survey the industry is now awaited with interest.

Report on South Africa's Natural Resources

A number of interesting disclosures have come to light from the report of the Natural Resources Development Council of South Africa, which has completed a survey of the Free State goldfield, writes our South African correspondent.

The Development Council in its report ranks the van den Heevers Rust, the Saaiplaas and Erfdeel areas as having disclosed promising drilling results; and classifies an extensive area south of the Odendaalsrus sector (i.e., south of St. Helena), another east of the Hennenman-Virginia main railway line, and still another smaller area west of the same section of rail-line adjoining the Saaiplaas area, as insufficiently prospected. South of St. Helena, mining development is regarded as possible on the farms Tarka 656 and Jurgenshof 490; the same posibility exists in respect of the farms

Whites 496 and Wilhelmina 548 in the other areas. The survey points out that borehole logging and underground tests indicate the existence of a number of uranium-bearing horizons in the Free State goldfield, including those with economic gold content. (Here may be mentioned the expectation, unofficially expressed locally but with a reasonable basis, that the Merriespruit mine may in due course be linked with the uranium extractive operations and the production of sulphuric acid at the Virginia mine.)

Next year, Free State Geduld, Loraine and Merriespruit are expected to reach the stage of production, and these will be followed by the Jeannette mine. Full production by the existing 13 Free State mines should be reached, states the survey, within 3 to 4 years from the start of milling. These 13 mines which employed 5,888 Europeans and 36,736 non-Europeans in December last year, will employ an estimated 11,000 Europeans and 81,000 non-Europeans in 1963. These respective figures will increase to about 13,000 and 90,000 by the same year, if in the meantime mines are established in the Saaiplaas and van den Heevers Rust areas.

Regarding coal output in the Free State goldfield, the survey states that the many coal seams intersected are of low quality and for the most part, at an uneconomic depth. However, in the van den Heevers Rust area, the depth of the seams is less than 600 feet, the coal is similar to the Vereeniging deposits, and sufficient reserves justify the establishment of a colliery. This possibility will become clearer as the goldfield develops. The coal is suitable for household uses, steam raising and electric power generation.

In so far as power supplies for the Free State mines and other consumers in the Vereeniging-Vierfontein-Winburg triangle are concerned, the survey affirms that requirements will be fully satisfied when the Vierfontein and Taaibos stations are in full generation. The former has already embarked in initial output; the first generating set in the latter will be commissioned in the immediate future. Water supplies for the goldfield are pumped from Balkfontein on the Vaal River. The existing 21 and 32 in. mains deliver 16,000,000 gallons a day; a third pipeline of 45 in. dia. is being laid and will deliver 36,000,000 gallons a day.

Nigerian Mining Data

In the official report on Mining in Nigeria for the 12 months ended March 31, 1953, the Minister of Mines and Power, Mr. Okoi Arikpo, writes warmly of the debt which the country owes to Mining and the great properity of the industry during the almost unprecedented boom period of the period covered. Mines yielded in direct revenue to the Government £1,411,030 of which royalties on tin accounted for £1,200,000 and on columbite for £135,000. Production of tin and its associated minerals, wolfram and tantalite showed little variation on the previous year, but columbite responded to a rise in price of from £16 to £32 per unit by an increased output of from 1,115 to 1,406 tons.

The output of tin concentrates improved by 162 tons to 11,758 tons but the grade is not given; the yardage increased by about 900,000 cu. yd. and the average grade was slightly lowered at .71 lb. per cu. yd. against .72 lb. in 1951/52. The total yardage worked was 37,078,393 cu. yd. of which open hand paddocks contributed 10,873,973, gravel pumps 8,397,680, tributing 5,563,205, draglines 4,609,567, hydraulicking 3,646,310, dredges 2,068,400, shovels and Euclid's 1,808,990 cu. yd. Average costs for the various methods varied widely : dredges showed 7.55d. per cu. yd., draglines 12.06d., gravel pumps 21.98d., tributing hand labour (open casts) 21.61d. The Nigerian Electricity Supply Corporation generated 66,617,450 units, of which the mines took 90 per cent. Tin mining employed 58,924 natives out of a total of 63,232 engaged in base metal mining. In Malaya the total tin mining force was about 44,000, while the Nigerian output at about 8,250 tons compared with 56,836 tons for Malaya in approximately the same period.

This contrast was due largely to the predominance of dredge mining in the latter country. Wages were raised ten per cent for all grades of labour at the end of the period covered by the report. The Amalgamated Tin Mines of Nigeria was by far the biggest producer with 4,710 tons of concentrates, followed by Ex-Lands with 641 tons and Bisichi with 488 tons. Prospecting revealed no new stanniferous areas of any importance and efforts to locate primary deposits were abandoned after discouraging results. The problem of how to work the deep leads remains unsolved : however in one instance where the surrounding country had been eroded below the level of the wash an adit at the intersection gave values of 75 to 125 lb. of cassiterite to the cu. yd. which should stimulate further study of the problem. The average production cost f.o.r. was £332 per ton, and the average profit £170 helped largely by amalgamated tins return of £221 per ton profit.

In view of the absence of any new discoveries of tin during the year and the well known uncertainties of tin distribution in the country it may be noted that reserves of cassiterite according to operators' returns were on March 31, 1953, 160,972 tons of proved and 39,194 tons of indicated ore : which the corresponding figures for columbite were 7,835 and 3,335 tons respectively.

The doubling of the price of columbite during three-quarters of the year greatly increased the profit received on this mineral mainly a bi-product of tin workings. This "sweetener" however was not available to all the tin alluvial concerns : out of a total produced of 1,406 tons (1,115 in 1951-52) Amalgamated Tin contributed 575.65 tons, Jantar 226, Minerals Research Syndicate 144.82 and Bisichi 135.93 tons. Other companies are preparing to take advantage of the record price and prospects of its continuance : thus Base Metal Mines of Nigeria with an output of 28 tons only booked a contract with the Defence Materials Procurement Agency for £250,000.

In the period under review profits from columbite were remarkable averaging £1,348 per ton stimulated by the big Amalgamated Tin's contribution which realized approximately £1,794 a ton ; the average cost of production was £202 a ton. Much of the output was derived from old tailings and as these are worked through this low cost figure will rise. Work on primary columbite occurrences from the decomposed granites is being actively prosecuted both by the Geological Survey by interested companies especially the Amalgamated Tin Fields which has designed a field plant employing a 10 in. gravel pump delivering work to Pan American Jigs, which if it proves successful should ensure the existence of large resources of columbite in the country.

There is evidence of high losses of fine grain cassiterite from the sluice boxes and this is even more the case with columbite especially from the primary deposits. The Mines Department accordingly arranged for Mr. F. Bice Mitchell, the well known ore dressing expert, to visit the Plateau Minefield to investigate the whole problem of improved recovery.

Production of other metalliferous ores, never important, declined during the period under review. Gold output fell to 1,174 crude oz. compared with 1,840 oz. in the previous year, but there was much illegal working in the Niger province. Developments in regard to the establishment of a lead-zinc industry were disappointing. The A.S. and R. discontinued its support of the Nigerian Lead-Zinc Company in developing the Abakaliki-Nyeba area in Agoja province partly owing to the very heavy water encountered. Development is said to have shown some 1,600,000 tons

of probable and possible ore with good lead and zinc values. Operations elsewhere were disappointing. No work was done on the pyrochlore bearing granites but the Geological Survey Department planned the drilling of ten boreholes in the Kaffo granite.

No coal appears to have been produced during the year nor is there any mention of this branch possibly only development at Enugu was proceeding through a considerable working force must have been employed as there were 1,675 accidents, fatal, serious and slight, recorded underground and 68 on surface.

The Shell D'Arcy Petroleum Development Company of Nigeria spent £1,375,500 on oil surveying and drilling during the year. The Ihuo deep test well was stopped at a depth of 11,228 ft. after gas and oil indications had been encountered at intervals between 6,521 ft. and the bottom of the hole. Shallower bore holes appear to have yielded only geological data.

Western United States

(From Our Own Correspondent)

Portland, Oregon, July 27.

Suspension of the copper import tax of 2 c. per lb. will be continued for another year, or until June 30, 1955. The Bill which was signed on June 30 contains the same provisions as in the past, that if the price should decline to 24 c. or less for a full calendar month the duty would be restored automatically. Market authorities expect the 30 c. price to be maintained throughout the third quarter but do not venture any prediction beyond that.

Moves for the purchase of lead and zinc for the stockpile resulted in considerable confusion as to price, especially in the case of lead. This was finally adjusted when General Services Administration was authorized to purchase at market price. Lead was sold to the stockpile at 14 c. and zinc at 11 c.

In line with the current tax revision legislation the Senate Finance Committee has approved an amendment by Senator Malone, of Nevada, to the tax Bill which will increase depletion allowance from 15 to 23 per cent on 27 strategic and critical minerals.

Congress has approved a resolution to continue operation of the Texas tin smelter until June 30, 1955. This action, contrary to what had been expected, is attributed to the crisis in Indo-China.

GOLD-SILVER

Esmeralda Extraction Co. has purchased the tailings dump, estimated as in excess of 2,500,000 tons, of the Tonopah Reduction Co. at Millers, Nevada. The plant treated the ores of the Tonopah Mining Co. and the Tonopah Belmont when those mines were active. Thorough sampling and metallurgical tests indicate gold, silver and tungsten in sufficient quantity to be profitable under present-day methods. Under previous operation the tungsten was ignored. A 500 ton mill will be erected.

COPPER

Progress in moving the plant of Castle Dome and its re-erection for use of Copper Cities Mining Co. in Arizona is sufficiently ahead of schedule that production is expected to start not later than August, at least four months sooner than originally planned. Four of the seven units of the concentrator will commence operating then and refined copper should be ready for market by December 1.

LEAD-ZINC

Again interest in lead and zinc seems to centre in the Coeur d'Alene district in Idaho where development continues in spite of generally unfavourable market conditions. Outstanding at present is the completion by Bunker Hill and Sullivan of the deepening of its three compartment Crescent shaft from the 1,200 to the 3,200 level. The 2,000 ft. were sunk in 11 months, working six days a week, not a world record by any means but an outstanding performance under conditions existing in this district.

It would be a relief for a month to pass without some unpleasant news from the lead-zinc industry but now we must record the closing of International Smelting and Refining Co.'s lead-zinc plant at Tooele, Utah.

URANIUM

Interest in uranium mining has brought about a proposed modification of the mining laws which has been characterized as the most important move of its kind since original passage of the present law in 1872. Favourable reports have been made by the committees of both houses of Congress on a Bill which will permit location of mining claims on lands included in leases for oil and gas and other minerals covered by the Minerals Leasing Act. Locators of such claims may develop them and receive patent under the general mining law, with a reservation to the United States of such minerals as are subject to lease. This is a notable departure from past policy and meets with the approval of the mining industry. It was brought about by the fact that certain regions under lease in the Colorado Plateau area appear favourable for uranium development.

Increase in development in the Colorado Plateau region has resulted in an accumulation of untreated uranium ores such that three of the present treatment plants are to be enlarged. Anaconda will enlarge its carbonate leach plant at Bluewater, New Mexico, which is treating limestone ores by building an addition which will house an acid leach plant for treatment of sandstone ores from the same area. Vitro Chemical Co. will increase its plant at Salt Lake City by one-half its present capacity and A.E.C. will enlarge its plant at Monticello, Utah, by building an acid leach plant in addition to its present soda ash plant.

Gramlich Exploration Co., of Moab, Utah, recently made a shipment of uranium ore from its Bluejay mine to Climax Uranium Co. for which it received settlement on the basis of $4,034.42 per ton.

QUICKSILVER AND NICKEL

The quicksilver situation continues confused with the price recently reaching a new high of $285 to $290 per flask (76 lb.), approximately 50 per cent above the yearly average for 1953. While domestic production has increased somewhat producers are chary about rapid expansion as too many times in the past they have reacted to a similar situation by enlarging operations only to have " the rug pulled out from under " by a deluge of foreign metal. At present the reason for the price increase is not apparent. The government has announced a purchase plan for the metal by which G.S.A. will buy 125,000 flasks from domestic producers and 75,000 from Mexico at a guaranteed price of $225 which will be maintained until December 31, 1957. Notwithstanding this announcement there was no immediate change in the market price. It is the feeling in the industry that these high prices will not continue but will decline to approximately $225.

At Nickel Mountain, in Oregon, Hanna Corporation has commenced mining nickel ore and stockpiling it at the smelter site. Power transmission and transformer facilities have been installed and it is expected that initial production will commence before September 1.

South African Gold Mining and the State of the Union at Mid-Year

In his recent annual review of financial and economic conditions in the Union, the Governor of the South African Reserve Bank was able to comment that the overall economic situation in the country is now sounder than for some time. The balance of payments has begun to turn in its favour and there are good prospects of a substantial further improvement in the near future. This favourable trend should ensure the uninterrupted completion of existing development programmes in the various spheres of the economy, including the gold mining industry; and should tend to encourage and promote new undertakings, for example those based on the country's considerable untapped or partially developed natural resources, particularly in respect of metals and other minerals, chemicals and textiles, reports our South African correspondent.

Referring to the exploitation of the latter, the Governor reiterated the policy followed by the Union in keeping its door open both ways to overseas capital and treating this capital on the same footing as indigenous capital. The policy of consolidation followed over the past two years has been generally effective. Various factors have contributed to this : the co-operation of financial institutions and public authorities in the monetary aspects; the labour, power, transport, and capital shortages; and the overseas loans raised. Another favourable factor has been the continuance of great prosperity in the world diamond trade; and the checking of inflationary pressures, abroad and locally. This consolidation is reflected in the improved balance between public and private development, to the extent that while such services as power, transport, telecommunications and water supply have not yet completely overtaken the backlog, this is being steadily made up. There has also been a better alignment between development and current production; greater use is being made of local raw materials and exports of manufactured goods are receiving more attention; the available labour is now being more efficiently utilized and more appropriately distributed between development and production and between the net-export and the net-import industries.

RISING GOLD PRODUCTION

Commenting specifically on the mining industry, the Governor pointed out that gold output from the new mines has been initially secured at the expense of the older mines due to the labour and power shortage, but that the recent increase in the total supply of mine labour has already brought about a rising tendency in the total gold output. In 1954 to June-end, gold output rose by 460,000 oz. or 8 per cent compared with the corresponding 1953 period, while coal output increased by about 4 per cent. No statistics of uranium production are available. Output of diamonds, copper, platinum, manganese, chrome, and asbestos, have represented a mixed pattern of increases and decreases and did not apparently reflect any appreciable net change in the aggregate output. Generally in the 1953/54 year, a further expansion of economic activity was indicated, in terms of both physical and monetary volume, in almost all spheres of activity. The investment rate was maintained at a relatively high level, the principal factor being a general increase in the production of goods and services. The 1954 import programme again provides for large deliveries of capital equipment and for total imports of at least the same magnitude as through 1953. Increased receipts from 1954 exports of gold, uranium, etc., and from capital inflow are expected and it is possible that the year will show a net surplus in the balance of payments for the first time since 1950. Regarding money rates, an active official contribution towards a general lowering of these is not contemplated, but at this stage there would not be official counteraction or retarding of such a movement providing it did not assume undue dimensions in relation to other economic factors. The Reserve Bank may even decide to follow the movement without leading it. Perhaps a lead to future official action in this connection may be found in the Governor's words that the South Africa economy as a whole will probably remain fully extended until the year-end.

The gold mining returns for the first half-year certainly reflect the recent improvement in the outlook for the industry. The tonnage milled at the level of 30,248,900 tons is equivalent to an annual rate of nearly 60,500,000 tons, and the recovery of 6,061,496 oz. is equal to an annual rate of about 12,120,000 oz., excluding miscellaneous output. The latter represents production by the smaller mines in the Transvaal and recovery from by-product operations; for the half-year, it was 250,166 oz., equivalent to 500,332 oz. a year. These returns are markedly better than the averages for last year. The declared uranium profits for the half-year reached £3,320,499 compared with £1,828,067 for the whole of 1953.

The quarterly reports for the period ended June 30 fully reflected the above aggregate returns: tons milled and working profits were generally higher than in the first quarter, but working costs were mixed but indicated a somewhat marked levelling off to the uptrend. To some extent, the real position in respect of working costs is masked by the inevitably high figures returned by the new mines—something that will persist for some time.

MERRIESPRUIT'S NEW WORLD RECORD

The quarterly reports were generally considered more than satisfactory and were not without their features. Among the shaft-sinking mines, the report of Merriespruit was noteworthy in that a new world record was established in the No. 2 Shaft during June. The advance for that month was 597 ft., 12 ft. more than the previous record set up last year in the No. 2 Vlakfontein Shaft. Air-operated mechanical grabs of the cactus type were largely responsible for both these achievements and with refinements in technique, may make possible an advance of as much as 650 ft. in a month. The June sinking at Merriespruit averaged 19.9 ft. a day. The excavated diameter of the No. 2 Shaft is about 26 ft., and after lining 24 ft. 1 in. Lining in June was advanced 593 ft. By June 30, the shaft had been taken to a depth of 995 ft.; the final depth of the shaft will be 3,700 ft. The Basal Reef should be intersected at about 3,300 ft. The No. 2 Shaft should be connected with No. 1 shortly after mid-1955, and initial milling should not be long delayed thereafter. Reef development was considerably expanded in the second quarter: 1,845 ft. were sampled, 65.6 per cent payable averaging 341 in. dwt. respectively compared with 320 ft., 85.9 per cent, and 563 in. dwt. in the first quarter. Construction of the reduction plant has been started; the initial capacity will be 75,000 tons a month.

Another mine to catch the eye was West Driefontein,

which is shaft-sinking in Nos. 3, 4 and 5. The latter is unique in local mining practice. Rectangular in plan, the headgear is constructed of reinforced concrete and 204 ft. high. Two Koepe winders are to be installed in the top of the structure while the third winder—a conventional two-drum unit—will be housed on the shaft bank, as has been usual practice to the present. The No. 5 Shaft will be equipped with 15-ton bottom discharge skips. In the second quarter, it was advanced 40 ft. to 120 ft. In the same period, an improved sinking rate was achieved in the No. 3 Shaft, which was sunk 408 ft. to 2,786 ft. against 254 ft. in the previous quarter. Erection of the uranium plant has been started. This plant will also treat slime residues from the Doornfontein mine, where the necessary installations are now also being effected. During the second quarter, operations at West Driefontein were expanded further: milling increased to 153,500 from 138,000 tons and the working profit to £893,374 from £846,096. Reef development also increased to 4,710 ft. sampled, 100 per cent payability averaging 844 in. dwt. from 3,960 ft. sampled in the previous quarter. Ore reserves at June-end were estimated at 731,000 averaging 16.4 dwt. over 42 in.

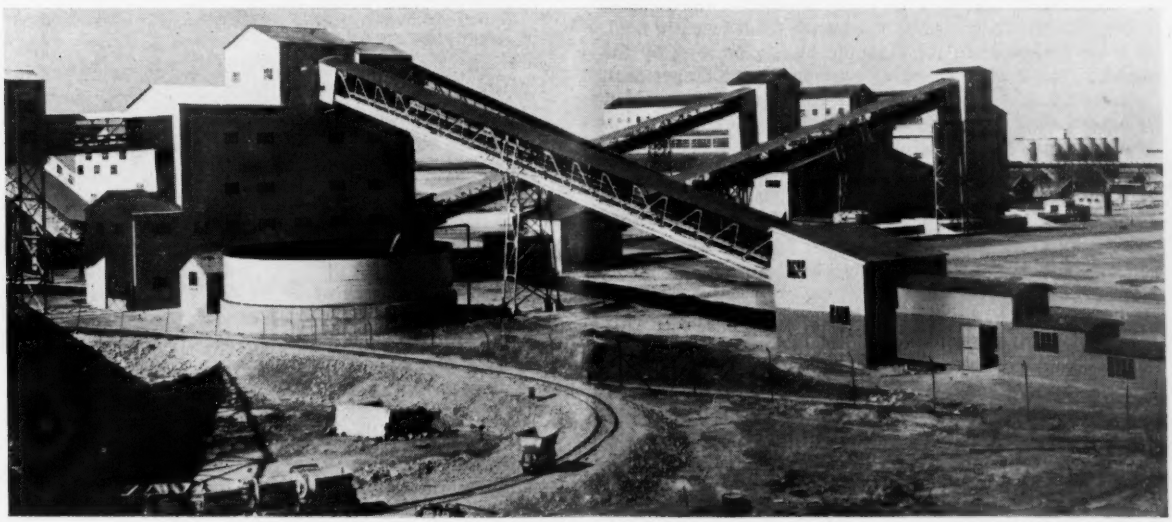
HIGH AVERAGE SINKING RATES

High average sinking rates were again returned by the Hartebeestfontein mine in both its shafts, in which sinking proceeds concurrently with lining and equipping. Notwithstanding water-bearing fissures, No. 1 was sunk 795 ft. to 2,931 ft.; and the No. 2 1,308 to 3,069 ft., through the second quarter. The No. 1 Shaft intersected the Vaal Reef from 2,861 ft. below the collar, a full exposure of the reef averaging 185 ft. around the periphery. The shaft is located in a section of relatively lower grade than average indicated for mine. At the neighbouring Buffelsfontein mine, water-bearing fissures in dolomite formations also required cementation; the Pioneer Main Shaft being advanced 330 ft. to 548 ft., and the Ventilation Shaft 565 ft. to 628 ft. The No. 3 Vertical and Subvertical Shafts that serve the south-western sections of the Vaal Reefs mine and the south-eastern sections of the Western Reefs mine have now been commissioned. More to the east, the Vaal Reefs mine is engaged on the sinking of twin vertical and subvertical shafts: the former are near the sinking stage. In both cases, one of the twin units will be the main hoisting and the other the ventilation unit. During the second quarter, the subvertical ventilation shaft was sunk 323 ft. below the main bank on 40 level, and preparations advanced for the sinking of the main hoisting unit. Vaal Reefs sampling increased to 1,335 ft. averaging 498 in. dwt. in the second quarter, compared with 770 ft. and 521 in the first.

IMPROVED DEVELOPMENT RESULTS

The Welkom mine proceeded with the deepening of the two shafts, and in other directions expanded operations as well. Reduction plant extensions to a capacity of 125,000 tons a month were nearly completed by June-end, and through the quarter, milling rose to 227,000 tons from 186,000 and the previous working loss of £6,216 was converted to a profit of £18, 251 in the second quarter. Sampling increased to 6,160 ft. averaging 374 in. dwt., from 5,820 ft. averaging 293 in. dwt. in the first quarter. The completion of the ore-pass system at the No. 3 Harmony Shaft is now in hand, and with this effected, the shaft will be available for hoisting. Meanwhile, underground operations are limited to the capacity of the Ventilation Shaft. Test milling was initiated in June in a reduction plant practically completed at June-end to a capacity of 45,000 tons a month; extensions to double this capacity are in progress.

In general, reef development results were maintained at a very satisfactory level during the second quarter. Points of particular interest here were the improved reef values in Free State Geduld in the closing stages from those obtained earlier in the period: 695 ft. sampled in the quarter averaged 594 in. dwt., compared with 376 in. dwt. earlier in the quarter and with 1,316 in. dwt. over 50 ft. sampled in the first quarter. Crosscutting to reef proceeded in the No. 2 Shaft area. In the No. 1 Shaft area of Loraine mine, there was the substantial improvement to 2,345 ft. sampled averaging 292 in. dwt. from 1, 540 ft. averaging 237 in. dwt. in the first quarter. At President Steyn mine, a greater footage was sampled in the richer No. 2 Shaft area. The President Brand mine did not maintain in the closing stages the very high values obtained earlier in the quarter, but the average for the period was higher than in the first quarter. Production at this mine has been eagerly awaited, and is now scheduled for the beginning of August. Milling at Western Holdings was again adversely affected by the faulted sections where reef development has been largely concentrated. However, development ends are being advanced in more favourable sections.



General view of President Brand's Reduction Plant

Experimental Diamond Core Drilling at the Auguste Viktoria Mine

An experimental diamond core drilling programme recently carried out in lead-zinc and gaseous coal seams at the Auguste Viktoria mine, Marl-Huls, in Westphalia, Germany, was particularly concerned with horizontal drilling in a lead-zinc face and up-bank drilling in gaseous coal seams. The operations were carried out with two Craelius type X4 drills and one Craelius type XF drill and the results showed that upward drilling in coal seams—though requiring more laborious and complicated preparations—was achieved at a lower cost per drill meter than the horizontal drilling in ore faces with either of the drill units employed. Mr. Bohl, a mining engineer attached to the staff of the Auguste Viktoria mines, in the following article, condensed from his paper presented at the Metal and Mining Congress held in Bonn last September, describes the operations and gives comparative statistics of costs which have been converted at the rate of D.M.11.7 to the £ sterling throughout the article.

A programme of experimental diamond core drilling was carried out at the Auguste Viktoria Mines, Marl-Huls, which are situated about five miles north-west of Recklinghausen in Westphalia, Germany. The programme comprised horizontal drilling in a lead-zinc face and up bank drilling in gaseous coal seams.

This programme was carried out with two Craelius Type X4 drills and one Craelius Type XF drill. The Type X4, a high speed drill with low bit pressure, is used with diamond bits only, while the Type XF can also be used with hard metal bits in soft to medium soft rock formations. The X4 drill weighs 85 kg. and is one of the smallest types of diamond drill manufactured in recent years. With a capacity to a maximum depth of 100 metres.

THE DRILL BITS DESCRIBED

Both the X4 and XF units are manufactured principally for use with diamond bits, and in this connection it might be added that hard metal bits were rarely used at the Auguste Viktoria Mines. Consequently, all observations in this article relating to bits are confined to those used in diamond drilling operations. In the normal diamond bit, the hard metal matrix is set with ¼ to1/30 ct. industrial diamonds, or is mixed with diamond dust. Bits used with the X4 and XF drills have a diamond setting which varies between 7 and 30 ct. per bit.

Bits intended for horizontal or upward drilling operations are manufactured with a cylindrical inside wall, but for vertical drilling the inside of the bit is conical in shape in order to accommodate a core spring which grips the core and prevents it slipping back during extraction. Where it is unnecessary to obtain a core, as in the drilling of shot-holes, bits of either convex or concave front face are used. It is normal practice for diamond bits to be reset by the makers after a wear factor of between 50 and 60 per cent, the remaining diamonds being credited to the customer. Diamond dust bits, however, are used to the complete extent of their operational life. A reamer coupling, also set with diamonds, is used between the bit and drill rods to minimize outer wear on both bits and rods, as well as to maiintain the bore dimensions of the borehole within specified limits.

Various types of bit were considered during the operations at the Auguste Viktoria Mines. "Diabor" bits with diamonds of ¼ to ⅛ ct. drill speedily but are suitable only for unbroken rock formations. The cheaper "Diamy" bits, produced with small, closely set diamonds of 1/10 to 1/30 ct., are effective in brittle and unbroken formations. They are not always so speedy in operations as the "Diabor," however, and thus find their most useful fields of application in ore and coal mines of a type similar to the Auguste Viktoria. Up to the point of 50 per cent wearability, "Diamy" bits give a varied performance which depends on the ore conditions prevailing. In brittle to hard formations they have a drilling life of 20 to 40 drill m., while in homogeneous to soft layers they can operate for 200 to 250 m. Core yield, while dependent on the size of bit and the formation entered, is always higher when drilling is accomplished with diamond bits. In order to obtain the maximum percentage of core recovery, the X4 drills were set at their lowest drilling speed of 1,000 r.p.m.

Horizontal core drilling was carried out in the shaft of the lead-zinc mine in order to determine the direction and ore content of the Blumenthaler Sprung and at the same time to drain the faulted area, which is frequently water-bearing. A further objective was to find out whether further ore bearing strata worth exploitation existed behind veins already mined. Both types of drill were employed. The X4 reached a maximum depth of 65 m. at 36 mm. dia. and the XF 171 m.

In considering performances per shift, it should be noted that all horizontal drilling was carried out in broken and quartz-bearing formations. The X4 unit drilled 353 m. in the following stages:

Operation	*Shifts*	*Operators*
Transport and erection (12 holes) ...	19.5	2
Actual drilling	79.5	2
Removal or breakdowns	5.0	2
	104.0	2

This table shows an average performance of 3.4 drill manshift, inclusive of all transportation and erection, and 4.4 drill manshift on actual drilling.

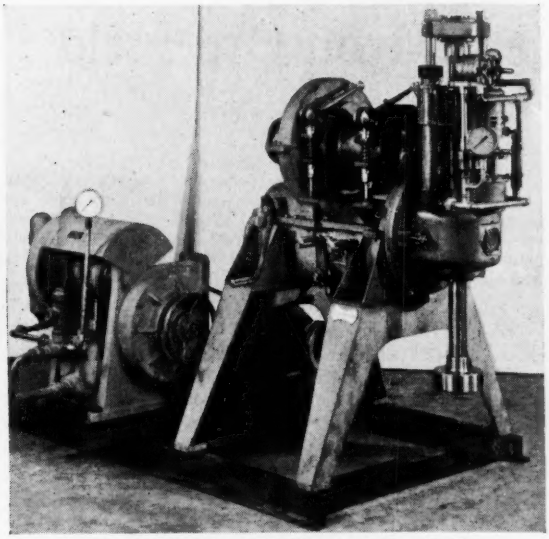
Horizontal drilling with the XF reached a total depth of 215 m., the stages being as follows:

Operation	*Shifts*	*Operators*
Transport and erection (2 holes) ...	11	3
Actual drilling	60	3
Removal or breakdowns	3	3
	74	3

In this case, the average performance was 2.9 drill manshift, inclusive of all transport and erection, and 3.6 drill manshift for actual drilling.

Upward drilling was undertaken in gaseous coal seams in a face named the No. 3 shaft, its objectives being to locate faults in the strata, as well as to determine the position of fireclay. A Type X4 unit was employed and drilling was carried out to a depth of 80 m. This depth was achieved despite the fact that the bit pressure was reduced by the weight of the rods, due to the absence of a hydraulic weight balancing device on the machine. Since considerable deviations occur in upward drilling of over 7 m., with consequent danger of fracture to the drill rods, it is not advisable to use either type of unit for upward drilling in excess of this length.

Under normal conditions in the Ruhr-Carbon layers, upward drilling with the Type X4 drill gave better results than those obtained horizontally in the lead-zinc face. The time and labour occupied by drilling and ancillary opera-



The Craelius Type XF Diamond Core Drill

tions were as follows:

Operation	*Shifts*	*Operators*
Transport and erection (18 holes) ...	61	3
Actual drilling	94	3
Removal or breakdowns	12	3
	167	3

Here the average performances were 4.1 and 7.3 drill manshifts respectively, and performances of 15 drill manshifts were frequently recorded.

It is apparent from these figures that drills of both types operated efficiently. Small defects were anticipated by regular inspection, and breakages of drill rods occurred only twelve times on a total hole length of 1,252 m.

COSTING STATISTICS

The expenses involved in diamond drilling may be gauged from the following observations. In horizontal drilling, carried out in broken formations with a Type X4 drill operated by two men, depreciation of drill and pump totalled D.M.2.25 (3s. 10d.) per m., the equipment having a purchase price of approximately D.M.8,500 (£726 8s. 2d.), with interest at 6 per cent, and being estimated to withstand 5,000 drill m. during 10 years. Depreciation of drill rods amounted to D.M.1.85 (3s. 2d.) per drill m., and in this case the purchase price of equipment was approximately D.M.3,200 (£273 10s.), with interest at 6 per cent, while the rods were estimated to withstand 2,000 drill m. during four years and had already been used to a depth of 1,037 m. Repairs and maintenance of drills and drill rods, including wages of maintenance crew, cost D.M.4 (6s. 10d.) per drill m.

In the same operation, overheads such as air consumption for drill X4 and pump 10 m.^{3}, the cost of compressed air at D.M.6 (10s. 3d.) per 1,000 m.^{3} and a drill speed of 10 cm./min. totalled D.M.0.60 (1s. 3d.) per drill m. For operations through 353 drill m., wear of bits and reamer coupling at D.M.16.4 (£1 8s.) and D.M.3.6 (6s. 2d.) respectively, together with drillers' wages covering 208 shifts at D.M.19 (£1 12s. 6d.), plus 55 per cent costs of social services at D.M.17.35 (£1 9s. 8d.) per drill m., amounted to a total of D.M.46.05 (£3 18s. 9d.) per drill m.

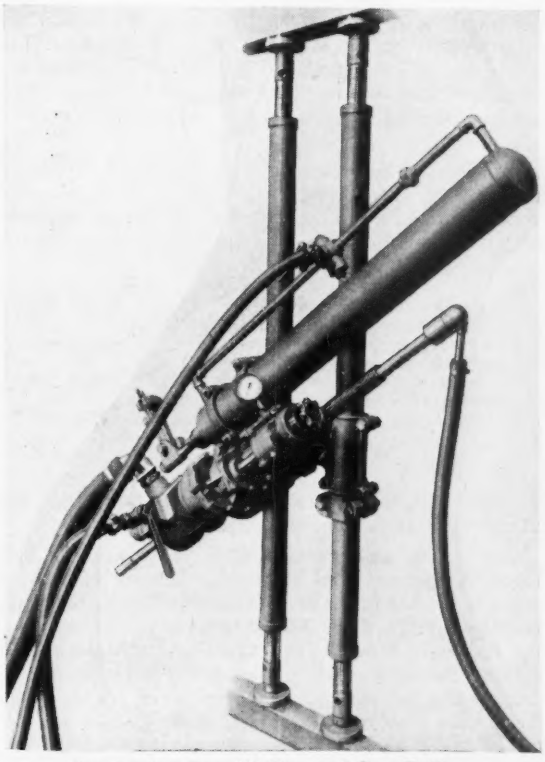
In the case of horizontal drilling in ore with the XF drill operated by three men, depreciation of drill, pump and rods purchased for a total of approximately D.M.36,000 (£3,076 18s. 4d.) was valued at D.M.8 (13s. 8d.) per drill m. Repairs and maintenance cost about D.M.5 (8s. 7d.) per drill m. Overheads, including air consumption of 15 m.^{3}/min. for the XF pump at a drill speed of 7 cm./min., amounted to D.M.1.3 (2s. 3d.) per drill m. For 215 drill m., wear of bits and reamer coupling at D.M.15.77 (£1 6s. 10d.) and D.M.4.7 (8s.) respectively, drillers' wages over 222 shifts at D.M.19 (£1 12s. 5d.) plus 55 per cent costs of social services, amounted altogether to D.M.30.4 (£2 11s. 11d.) per drill m., showing a total cost of D.M.65.1 (£5 11s. 3d.) per drill m.

For upward drilling in coal seams with an XF drill operated by three men, depreciation of drill and pump amounted to D.M.2.52 (3s. 10d.) and depreciation of rods to D.M.1.85 (3s. 2d.); repairs and maintenance cost approximately D.M.4.5 (7s. 8d.) and overheads at a drill speed of 20 cm./min. totalled D.M.0.3 (7½d.) per drill m.

Wear of bits and reamer coupling for 684 drill m. aggregated D.M.1.7 (2s. 11d.) and D.M.1.1 (1s. 11d.) respectively per drill m. Wages for 501 shifts at D.M.19 (£1 12s. 6½d.) plus 55 per cent costs of social services for 684 d.m., came to D.M.21.55 (£1 16s. 10d.), giving a total cost of D.M.33.25 (£2 16s. 10d.) per drill m.

From these data the comparative durability of tools and machines may be assessed. It will be seen that upward drilling in the coal seams, although requiring a more laborious and complicated set up, was carried out at a lower cost per drill m. than was horizontal drilling in ore faces with either of the units employed.

Throughout all these operations the Craelius drills showed normal wear and a high safety standard. The experimental programme at the Auguste Viktoria Mines has shown very clearly that the maximum depths of 100 and 300 m. achieved respectively by the Type X4 and Type XF units are possible in unbroken strata, whether horizontal or upward drilling is carried out.



The Craelius Type X4 Diamond Core Drill

The New Labrador-Quebec Iron Ore Field Comes into Production

At the end of last month the first shipment of 20,000 tons of iron ore from the new Quebec-Labrador, or Ungava ore fields, marked the coming into production of these immense iron ore fields containing more than 400,000,000 tons of working grade ore by the Iron Ore Company of Canada supported by five U.S. steel companies and the Hollinger and Hanna interests. This landmark in Canadian mining history was noted in our issue of July 30 and the following short article, largely extracted from a recent issue of the *American Metal Market*, describes some of the salient points of the project and recounts a few of the interesting details of the Iron Ore Company of Canada's giant ore loading and storing system constructed at Seven Islands, Quebec.

On July 31 the first shipment of 20,000 tons of iron ore from the new Labrador-Quebec or Ungava ore fields left Seven Islands, Quebec, for Philadelphia.

The history of the new Quebec-Labrador iron ore field dates back to 1866/70 to the Rev. Louis Babel, whose rough maps of the area made on his annual journeys were used by Dr. A. P. Low of the Geological Survey of Canada, who spent the field season of 1894 making a topographical geological survey of the district. While Dr. Low's contribution was not the discovery of iron ore, his report on the favourable nature of the geology for the occurrence of iron ore remained the basis for subsequent investigations. Dr. J. A. Retty, a Canadian geologist and Dr. A. E. Moss, now chief geologist for the Iron Ore Company of Canada (I.O.C.O.), conducted detailed geological work on the bleak tundra which led to Dr. Retty's discovery of the ore in 1938 and on his recommendation a licence was obtained for 3,900 sq. miles from the Quebec Government.

LARGER THAN MESABI

In size, the I.O.C.O. ore field compares favourably with the famous Mesabi iron ore range. The latter is 110 miles long and from one to five miles wide, while the Ungava ore field is 225 miles long and from 10 to 60 miles wide. However, the 70 mile productive zone in the Mesabi field is overshadowed by I.O.C.O.'s 90 mile stretch of high grade ore which, indeed, shows promise of extensions at both ends with the additional attraction of having a large tonnage of marginal material from which the excess silica can be removed by washing.

The original investment in 1942 of $10,000,000 was intended solely for further exploratory work to prove the value of the deposits and thereby attract the estimated $200,000,000 necessary to carry out the following construction programme :

	$
Railway	75,000,000
Rolling stock and other railway operating equipment	50,000,000
Harbour facilities and ore docks at Seven Islands	15,000,000
Power development, town sites, mining equipment, etc.	60,000,000
	$200,000,000

To date $45,000,000 has been spent on wages and $155,000,000 on equipment and supplies.

One of the chief reasons why the project has been called the biggest initial mining development ever undertaken in Canada is due to the remoteness of this immense proven ore body of 500,000,000 l.tons in an area known as the Labrador Trough. Two-thirds of the deposit is in Quebec; the other third in Labrador. The key to the ore fields is the 360 mile railroad from Seven Islands to the Knob Lake area, the operation of which is under the control of I.O.C.O.'s subsidiary company—the Quebec North Shore and Labrador Railway.

This railroad has been described as carrying the heaviest daily consistent load of any railroad in North America and is the first major railroad to be built in North America since the spanning of the Rocky Mountain at the beginning of the century. In fact, access to the area was so difficult that transportation had to be carried out in conjunction with the largest civilan air-lift ever to be put in operation. The locomotives used are of the 1,500 h.p. switcher type employed for both the road haul and yard switching service, thereby enabling an interchange of units between the line and the yard as well as centralized maintenance in the main locomotive and car shop at Seven Islands. The ore trains are controlled by the signal system commonly known as C.T.C., aided by radio and powered remote-control switches will handle sidings for the passing of cars at the South-end while spring switches will be in operation at the North-end.

The 95-ton ore cars run on roller bearings and are of the solid-box welded type larger than any now in service in the Dominion. This is the first application of roller bearings to all the freight cars operated by one railroad. They are expected to reduce maintenance by cutting starting resistance more than 80 per cent and will also permit a 30 per cent increase in running speed. For better braking, steel wheels with a dia. of 36 instead of the standard 33 in. are provided because they assure better distribution of weight per in. of circumference. Cars are equipped with empty and load clasp brakes and semi-tight lock couplers.

SEVEN ORE TRAINS A DAY

Operation will begin later over two sub-divisions, each 180 miles long. Loaded trains will make the trip in 14 hr. and empty ones in 12. When production reaches the planned 10,000,000 tons a year, it will be necessary to run seven trains each day in both directions. Operating rolling stock consists of 49 diesel locomotives, 20 cabooses and 2,000 ore cars. Construction and maintenance rolling stock includes 175 ballast cars, 50 boarding cars, 20 pneumatic dump cars, 100 flatcars, 15 tank units and 20 boxcars, as well as two 250-ton wrecking cranes.

During 1952, 70,000 bags of cement were flown 300 miles to the Menihek Dam, 30 miles south of Knob Lake. Thus men and equipment were leap-frogged by air ahead of the main working area. Food and camp facilities, compressors and tractors, drills and bits, in short, everything they needed, greeted the gangs as they moved up by stages up the line. At first air transport cost 70 c. a lb., but later it was cut to as little as 11 c. per lb.

Since 1950 men and machines have been laying 362 miles of steel rails into the Canadian hinterland north from Seven Islands, Quebec, roughly 500 miles northeast of Montreal and 1,000 miles north of New York City. They have built two hydroelectric stations, one at each end of the line, as well as extensive crushing, grading and loading facilities for the iron ore that is the cause of this tremendous activity—$200,000,000 worth of construction and mine

development work aimed at replacing the dwindling 50-year-old Mesabi Iron Range in northern Minnesota and, for both economic and security reasons, at making the North American steel industry less dependent on ore from overseas countries such as Sweden, Liberia, Brazil and Venezuela.

The bulk of the ore will be marketed in the United States; later some will go to Britain and Western Europe. Canada will not become a customer until her steelmaking facilities have grown considerably. There is an over-all production deficit of only 200,000 tons per year from existing mining properties in Canada. However, I.O.C.O. is setting aside large reserves for ultimate use there and is co-operating with Laval University in Quebec City and the Mines Department of Quebec in research work aimed at the successful absorption of Ungava ore within the province.

THE ORE STORING AND LOADING SYSTEM

With the first shipment of iron ore, one of the most modern and efficient ore storing and loading systems constructed at Seven Islands, situated at the end of the 360 mile newly built railroad, comes into operation. This large installation was described in our issue of December 21, 1951, but some of the more salient points of the system are given below in order to give a more complete picture of the whole project.

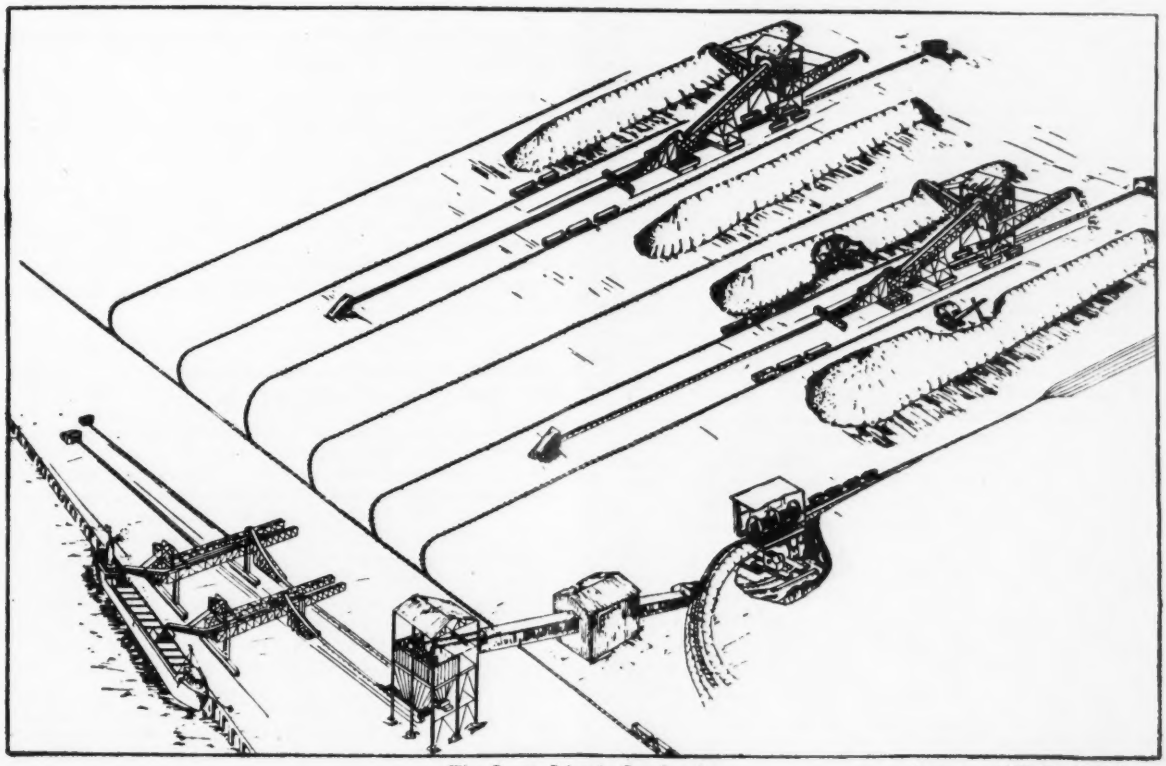
The great ship loading units and the stackers illustrated below are of unique design and the whole system is entirely of Canadian origin.

The function of the stockpiling and loading system is either to send the ore through to one of the four stockpiles, each capable of containing 440,000 tons, or to load it directly on to the ships, although the system is also designed to pick off the ore from the stockpile and convey it to the ships. If, for example, the ore is to be stockpiled it feeds on to one of the two outhaul conveyors which lead to the two main stacker belts. These two conveyors are each 4 ft. wide, operate at a speed of 550 f.p.m., and are housed in an underground tunnel 489 ft. long to the first main stacker belt and 887 ft. to the second. The outhaul conveyors discharge on to the two main stacker belts which are also 4 ft. wide and operate at a speed of 55 f.p.m. The main stacker belts are over 2,300 ft. long and, after rising to surface, each travels on a line between two of the stockpiles.

The stackers themselves are the key to the stockpiling operation and have a travel of about 2,000 ft. They are each about 200 ft. long, rise to a height of 60 ft. above the ground and weigh over 300 tons. When discharging ore these huge mechanisms move up and down between the stockpiles at a speed of 50 f.p.m., but they are capable of travelling at double this speed over longer distances with low load. The four storage piles shown in the diagram have a capacity of 1,720,000 tons. Under the present design, each pile will be about 200 ft. long, but the stacker belts are so designed that the stockpiles could be extended another 550 ft. by merely extending these conveyors which increase the storage capacity by over 25 per cent.

The two shiploading units constitute another piece of original design. They weigh over 210 tons each and rise to a height of about 45 ft. above the ground. They have a horizontal length of about 85 ft., and ride on tracks spaced on 70 ft. centres. Beyond the track there is a rear projection of about 38 ft., and at the other end a projection over the dock of about 20 ft. Each unit travels along the length of the dock for a distance of 514 ft. and can move at a rate of 150 f.p.m.

The two ship loaders consist of a main bridge which traverses longitudinally along the dock. Attached to this bridge is a tripper for discharging the dock belts on to shuttle boom belts. The shuttle boom unit travels back and forth inside the main bridge. Its outer end constitutes a boom which can be raised or lowered to suit various loading conditions and sizes of ships.



The Seven Islands Ore Loader

By courtesy of "The Northern Miner"

REVIEWS

Metal Statistics, 1954.—*Published by American Metal Market. Pp. 848. With buyers' directory and index. Price $3.*

The 47th annual edition of Metal Statistics contains the same general assortment of statistical information on ferrous and non-ferrous metals, and miscellaneous subjects as was supplied in previous issues.

The situation with regard to world statistics remains virtually unchanged, states the editor, Mr. N. J. Langer, in the preface, in that world totals are still estimated because of the continued lack of reliable data from the Iron Curtain countries. Domestic statistics have been slightly augmented in this issue by the addition of tables showing a new index of steel production introduced by the American Iron and Steel Institute, and by new tables showing tool steel production, world production of cadmium, and monthly average prices of zinc-base die casting alloy ingot.

As in all previous editions, the prices given in this volume are generally based on the quotations published in *American Metal Market,* and are representative of wholesale selling prices. Government controls were completely eliminated in mid-February of 1953, so that price records are again reflective of values established in free markets under the law of supply and demand.

Statistics dealing with production and consumption are gathered from various authentic sources and particularly from the American Iron and Steel Institute, American Bureau of Metal Statistics, U.S. Bureau of Mines, Bureau of the Census, Copper Institute, American Zinc Institute, Lead Industries Association, and the International Tin Study Group.

Directory of Directors, 1954.—*Published by Thomas Skinner and Co. (Publishers) Ltd., pp. 816. Price £2 5s.*

The 1954 edition of the Directory of Directors, which has now reached its 75th year, lists the directors of all the principal companies in the United Kingdom and of a large number of private companies.

New companies are formed at the rate of about 250 per week, many of which are private companies, and therefore lists of directors and companies are constantly changing. Thus the new edition carries a substantial increase in the number of names of directors. The changes involve upwards of 5,000 entries and the names total approximately 35,000, including all the leading personalities in industry, commerce and finance.

Economic Bulletin for Europe, *Vol. 6, No. 2, First Quarter 1954. Prepared by the Research and Planning Division of the Economic Commission for Europe. Pp. 108. Price 3s. 9d. Available from all sales agents for United Nations publications.*

The first 24 pages of this useful publication deals with a review of the economic situation in Europe during the first quarter of 1954. The Bulletin figures shows that, taking 1950 as 100 the volume of imports into Western Europe from Eastern Europe in 1953 totalled 88 and exports from Western to Eastern Europe totalled 105, thereby exceeding the previous post-war high of 103 achieved in 1949. Nevertheless, the Bulletin stresses that the recent improvement in trade relations between Eastern and Western European countries should not conceal the fact that East-West trade is still at an extremely low level. In particular, far from being an all round increase affecting all European countries alike, the recovery indicated was almost exclusively concentrated on the U.S.S.R.

Accompanying the analysis is a list of trade agreements between Eastern and Western European countries in force as at June, 1954, as well as tables showing imports of Western European countries from Eastern Europe as well as exports from Western European countries to Eastern Europe by commodity groups in millions of current dollars during 1953. Special tables review East-West trade developments in coal, timber, grain and petroleum products. An overall matrix of trade between Eastern and Western countries shows the value of exports and imports in terms of the quarterly average for 1952 and the four quarters of 1953 as well as the first quarter of 1954.

TECHNICAL BRIEFS

The Chemico Sulphur Process

A process for the recovery of sulphur from low grade surface deposits has been described by T. P. Forbath (Trans. Am. Inst. Min. Met. Eng. 196, Tech. Pub. 3628-H). The ore is first of all crushed in two stages to about ¼ in. followed by wet grinding in a pebble mill to −28 mesh. The mill is operated in continuous circuit with a 28 mesh screen and the pulp concentration is kept to about 50-60 per cent solids. The slurry, adjusted to 30 per cent solids is then fed by means of diaphragm pumps to a coil-type gangue separator operating at 60 lb. p.s.i. with live steam. The temperature of the slurry is raised to between 250 deg. and 275 deg. F. so melting the sulphur. The small sulphur droplets coalesce into globules of up to 2mm. dia. due to the turbulent flow. Cold water is then injected into the slurry to bring the temperature down to about 190 deg. F. before leaving the gangue separator. The slurry passes on to a 20 mesh virbrating screen via a pinch-type pressure let down valve. The sulphur particles of 96-98 per cent purity which are retained on the screen go directly to a sulphur melting pit. This constitutes about one-third of the total amount of sulphur present and the rest, contained in the slurry, passes to a conditioning tank where the pulp density is adjusted to 20 per cent solids and pine oil, fuel oil or other flotation reagents are added. The slurry is then pumped to a bank of rougher flotation cells whence a concentrate containing 70 per cent sulphur is obtained. This then passes to a bank of cleaned cells producing a concentrate containing 90-95 per cent sulphur. The concentrate is dewatered on a rotary vacuum filter and passed to the sulphur melting pit. Middlings are recycled to the rougher cells through a thickener and tailings from the rougher cells are thickened to conserve water and incidentally heat, the thickened tailings then being discarded.

The sulphur in the pit is melted by means of steam coils and agitated. It is then pumped to a pressure filter to yield a product of 99.5 per cent purity, equivalent in amount to 90 per cent of the sulphur originally present in the ore. The filter cake, containing 40-50 per cent sulphur, is recycled. The plant deals with 90 tons of ore a day yielding 33 tons of pure sulphur.

Effects of Oxygen on the Ductility of Beryllium Prepared by High-Vacuum Distillation

Experiments to determine the effects of oxygen on the ductility of beryllium prepared by high-vacuum distillation have been described by C. S. Pearsall (A.E.C. M.I.T.-1104; Tidu 0625/69). The negative results obtained by the experiments indicated that no appreciable increase results from lowering the oxygen content to well below 1 p.p.m. The possibility of the brittleness at room temperatures being due to other impurities in the so-called pure beryllium metal is not excluded. The difficulty of preparing pure metal even with the best analytical methods is stressed, and a sketch of the vacuum distillation apparatus used is included.

Volumetric Procedure for the Determination of Zirconium in its Binary Alloys, with Uranium

The volumetric procedure for the determination of zirconium in its binary alloys with uranium is described by G. W. C. Milner and P. J. Phenneh in a 16 page booklet, "Atomic Energy Research Establishment, Harwell." The procedure described can be used for the rapid analysis of uranium-zirconium binary alloys after a preliminary separation of the zirconium as its insoluble mandelate from a perchloric acid solution of the alloy. It involves the addition of an excess of a standard solution of ethylene diamine tetra acetic acid to complex the zirconium, followed by the back titration of unused complexing agent with a standard iron solution using salicylic acid as the indicator. An accuracy of ±1 per cent is possible in quantities up to 100 mg.

This document may be obtained from the Technical Information and Documents Unit of the Department of Scientific and Industrial Research, Cunard Building, 15 Regent Street, London, S.W.1.

METALS, MINERALS AND ALLOYS

COPPER.—It is still by no means clear what exactly will prove to be the significance of the Chilean Government's plans for establishing a Copper Institute to replace the Central Bank of Chile as the sole selling agency for Chilean copper. Since we reported the likelihood of this development here last week, the Minister of Mines, Senor Uribe, has issued further statements which would seem to suggest that under the new scheme some freedom to sell the copper would be restored to the individual companies, subject to the Institute's right to intervene. This may well turn out to be the case if, as the Minister claims, the Bill providing for the Institute as part of a new deal for the Chilean copper industry proves to have been drafted with a view to stimulating copper companies to expand their operations and increase capital investment.

In this connection it would be interesting to learn what Senor Uribe would regard as a satisfactory level of copper production for Chile in the coming years. Chilean production, which reached 377,000 l.tons in 1952 and fell sharply from this figure in 1953 to 326,000 l.tons, seems destined for a further fall this year, as the combined output from Chuquicamata, Potrerillos and El Teniente only amounted to 169,000 l.tons for the first seven months of this year compared with 218,000 l.tons in the corresponding period of 1953. While the Chilean Government's anxiety to see some improvement in these figures is understandable, an increase to somewhere near the 1952 level should surely not involve any considerable capital investment and it remains to be seen whether the copper market could absorb more than 400,000 tons of Chilean copper per annum at present prices.

Tax reliefs and more satisfactory labour relations seem to us to be more likely to provide the key to increased output at any rate in the short term. It is to be hoped that the new Copper Bill will make some realistic provision for the former, while on the labour front it has been reported this week that the Chilean Minister of Labour has started triangular negotiations with the Braden Copper Company and the miners' unions in an endeavour to forestall the strike for higher wages which, in the absence of a settlement, is due to start on August 19 and to involve some 7,000 workers at El Teniente.

In connection with the breakdown in the discussions on African advancement in the Copperbelt, discussed under "Notes and Comments" in our issue of July 30, it is reported from Lusaka that the Government of Northern Rhodesia has appointed Sir John Forster to be chairman of the Board of Enquiry which it has set up to investigate the problem. In Britain Sir John is President of the Industrial Court and chairman of the National Arbitration Tribunal.

In the States the copper market appears to be standing up fairly well to the slack holiday period. The main producers report that their August output is already almost fully allocated and sales for August shipment are in excess of 55,000 tons. Shipments of refined copper to consumers' plants in July were about 12,000 tons down on the previous month at 92,000 tons.

LEAD AND ZINC.—The G.S.A. is reported to have accepted all producers' offerings of newly mined domestic lead and zinc for delivery before October 15, which the Administration called for last week. It is estimated that this week's purchases at the market price for the long-term stockpile programme amounted to between 8,000 and 10,000 tons of domestic lead and 15,000 tons of domestic zinc. These sales had a stabilizing effect on the price of both lead and zinc which have been steady in New York this week at 14 and 11 c. respectively, despite light consumer demand.

Stocks of zinc held by U.S. smelters at the end of July recorded a further small decline at 197,885 tons, the best end-month total since the beginning of the year. At the same time unfilled orders at the end of July were reported by the smelters as the highest since June of last year at 38,719 tons.

TIN.—The past week has shown the price of tin down by nearly £20 per ton over the level of a week ago. Singapore has been experiencing a lack of American buying, but how far this is due to seasonal influences and how far it reflects a wait-and-see policy among consumers in view of the possible £40 reduction in the ceiling price in the International Tin Agreement is conjectural.

Anything but conjectural, however, are the statistics of tin consumption in the U.S. steel industry published recently by the American Iron and Steel Institute, which make poor holiday reading for tin miners. According to the Institute's figures, the U.S. steel industry used 37,618 tons of tin during 1953 in achieving a record output of 4,800,000 tons of tinplate, compared with a consumption of 42,442 tons of tin in 1950 in the production of 4,600,000 tons of tinplate (the industry's second best output on record). In other words, during the last four years alone tin conservation technology in the States has advanced to the extent of causing a further 11 per cent reduction in tin consumption in what is its biggest single use.

The President of Bolivia stated recently in La Paz that the nationalization of Bolivia's mines had been consolidated despite what he describes as "the difficult situation on world metal markets." He revealed that Bolivian tin output in 1953 totalled 35,384 tons, which compares with exports totalling 34,639 tons as reported by the Tin Study Group. Exports during the early part of the current year were running substantially below last year's figures but no doubt this is accounted for by the fact that the new 12,000 ton contract with the R.F.C. was not signed until June and we may, therefore, expect to see accelerated exports later in the year.

The President also reverted in his statement to the question of the erection of a domestic tin smelter and indicated that foreign experts were at present engaged in planning such a plant. This presumably refers to the commission of four West German engineers from the Lurgi Chemical Machinery Company and from Krupps who were reported to have gone to Bolivia at the beginning of this year at the invitation of the Bolivian Mining Corporation. Uneconomic though such a project must be in itself, quite aside from the considerable surplus smelter capacity which already exists in the world, the possibility of a Bolivian smelter being established cannot be disregarded simply because it is patently uneconomic. In a country with a totalitarian economy business decisions are often taken for quite unbusiness-like reasons. Presumably the chief problems, which the Bolivian Government would have to face in the establishment of a smelter, would be the supply of the necessary hydro-electric power (an essential prerequisite in the absence of cheap fuel) and then the siting of the smelter so that transmission cables would not have to cover too great a distance on the one hand and the import of high grade ores for admixture with the Bolivian output would not have to bear excessive transportation costs.

There was no tin production at the Texas smelter during July owing to the fact that all existing stocks of ore had been scheduled for treatment before June 30, the original date of closing the smelter. Shipments under the new contract are not expected until some time this month.

ALUMINIUM.—The strikes threatening Alcoa and Reynolds were averted last week. The former agreed to pay increases involving a flat 5 c. an hour plus other benefits estimated at 7 c. an hour, while Reynolds settled for a 5 c. an hour increase. In announcing the settlements it was made clear that the cost of these wage increases could not be fully absorbed by the producers and price increases by all the big American producers have since been announced increasing the price of aluminium pig by ½ c. to 20½ c. per lb., and of primary ingot by 7/10 c. to 22.2 c.

A recent announcement by the Government of British Columbia makes it clear that Alcoa has failed in its bid for developing hydro-electric power from the Yukon basin. The concession has gone to Frobishers, who will undertake this operation through a subsidiary, Northwest Power Industries Ltd., at an expenditure of some $270,000,000 over the next eight years. Stories circulating in the Canadian Press last week suggest that Reynolds Metals may prove to have secured a participating interest in the Frobisher enterprise, but the precise extent and form of this is not yet clear. In addition to providing additional aluminium capacity, the Frobisher project is expected to include operations in asbestos, copper, lead, cobalt, manganese, nickel, iron and steel and zinc concentrates.

ANTIMONY.—The Bradley Mining Company announced recently that it has no immediate plans for re-opening its Yellow Pine smelter which was shut down in 1952 at a time when the price of antimony had dropped to around 39 c. per lb. Prior to the shut-down Bradley was producing about 90 per cent of the small U.S. domestic antimony production. Despite the improvement in antimony price this summer, which is now around 30 c. per lb., the company points out that current market prices are still considerably below the 39 c. level at the time of the shut-down and it seems that the market price has a long way to go before Yellow Pine comes back into production.

Iron and Steel

The brisk buying movement which has enlivened the holiday period in the iron and steel trade has lost none of its momentum. On the contrary it seems to be gathering strength and a resumption of full scale production, which will not be possible before the end of the month, is eagerly awaited. Absorption of maximum outputs for the remainder of the year is already assured and indeed consumers who have not yet covered their autumn requirements may find it difficult to do so.

There has been some improvement in the overseas trade but the main strength of the market stems from the heavy home demand. British industry is booming. Huge capital expenditures are projected or are in hand. The motor and engineering industries have scaled new heights of prosperity and ample supplies of steel have enabled the shipbuilding industry to speed up outputs.

The need for the employment of additional blast furnace capacity has become especially urgent. More basic iron will be required as the steel plants are restored to full production. Shortages of haematite and low and medium phosphoric iron are still acute, and although supplies of high phosphorous iron have hitherto been plentiful, the stoppage of two blast furnaces in Derbyshire for re-lining threatens to restrict the distribution.

British steel makers have successfully met the increased demand for semi-finished steel which has ensued upon the revival in the re-rolling industry. Most of the mills engaged on small bars and light sections have satisfactory programmes with which to re-start work after the holidays. Sheet makers and strip mills are fully booked to the end of the year.

Heavy arrears in deliveries of joists and sections and congested order books promise full employment for the heavy rolling mills and if the demand for thick plates has fallen off to some extent the lighter sizes are more difficult to obtain. Tube makers have a substantial volume of export orders in hand and there has been a marked revival in the wire trade.

The London Metal Market

(From Our Metal Exchange Correspondent)

A feature in the tin market has been a sudden fall in the Eastern price last Saturday of nearly £17 per ton due to the larger quantity on offer. The London market has partially followed the East, but there are signs of some recovery from the lower levels reached earlier in the week. The U.K. warehouse stocks have shown an increase and the backwardation has more or less disappeared. At a meeting in Kuala Lumpur on August 5 Reuters report that Chinese tin miners decided reluctantly to support the French proposal to reduce the ceiling price under the International Tin Agreement. The result of the referendum sent to European and Chinese mines in Malaya is expected to be announced on August 18. On Thursday morning the Eastern price was equivalent to £736⅜ per ton c.i.f. Europe.

The London Metal Exchange announced last Friday that a new standard copper contract has been approved, which will come into operation on and after October 4 for all prompts maturing on and after January 3, 1955. This provides that deliveries in fulfilment of contracts must be by means of warrants for metal which is in warehouses approved by, and registered with, the Committee of the London Metal Exchange. There has been no special feature in the market this week, and price movements have been small. It seems that some of the large copper producers in the United States are receiving demands for increased wages, which, if met, must increase production costs.

Lead has been a firm market, particularly for nearby metal, which may be attributed to the approach of the mid-August settlement, and also, it is thought, to the possibility of buying for Russian account since the Board of Trade indicated that the export of reasonable quantities for such a destination would be sanctioned.

There is very little to report about zinc, and with current month supplies plentiful the market has tended to be easy.

Closing prices and turnovers are given in the following table:—

	August 5		August 12	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Tin				
Cash	£746	£747	£724½	£725
Three months	£743	£744	£725	£725½
Settlement	£747		£725	
Week's turnover	425 tons		620 tons	
Lead				
Current month	£94¼	£94½	£95¼	£96
Three months	£92¼	£92⅝	£93	£93½
Week's turnover	1,200 tons		1,800 tons	
Zinc				
Current month	£74½	£74⅝	£74⅜	£74½
Three months	£74⅜	£74⅝	£74½	£74⅝
Week's turnover	3,300 tons		3,175 tons	
Copper				
Cash	£234¾	£235	£234	£234½
Three months	£233¼	£233½	£233¾	£233¾
Settlement	£235		£234¼	
Week's turnover	3,650 tons		3,425 tons	

OTHER LONDON PRICES — AUGUST 12

ANTIMONY

English (99%) delivered, 10 cwt. and over .. .. £210 per ton
Crude (70%) .. .. .. £200 per ton
Ore (60% basis) .. .. .. 22s./24s. nom. per unit, c.i.f

NICKEL

99.5% (home trade) .. .. £483 per ton

OTHER METALS

Aluminium, 99.5%, £156 per ton
Bismuth (min. 2 cwt. lots) 16s. lb.
Cadmium (Empire), 12s. lb.
Chromium, 6s. 5d./7s. 6d. lb.
Cobalt, 20s. lb.
Gold, 248s. 10d. f.oz.
Iridium, £45 oz. nom.
Magnesium, 2s. 6d. lb.
Manganese Metal (96%-98%) £225/£262
Osmiridium, £40 oz. nom.
Osmium, £50 oz. nom.
Palladium, £7 10s. oz.
Platinum, £30/£31
Rhodium, £42 oz.
Ruthenium, £22 10s. oz.
Quicksilver, £100 ex-warehouse
Selenium, 35s. 9d. nom. per lb.
Silver 72d. f.oz. spot and 72¼d. f'd.
Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

Bismuth .. .. 30% 5s. lb. c.i.f.
20% 3s. 3d. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (lumpy) £13 12s. per ton c.i.f.
" Refractory £13 4s. per ton c.i.f.
Magnesite, ground calcined .. £26-£27 d/d
Magnesite, Raw .. .. .. £10 - £11 d/d
Molybdenite (85% basis) .. 102s. 4d.-103s. per unit c.i.f.
Wolfram (65%) .. .. .. World buying 185s./190s.nom.
" " .. .. .. U.K. Selling 190s. + 10s. charges
Scheelite (65%) .. .. .. World buying price nom.
" " .. .. .. U.K. Selling 190s. + 10s. charges
Tungsten Metal Powder .. .. 15s. 3d. nom. per lb. (home)
(98% Min. W.)
Ferro-tungsten .. .. .. 12s. 3d. nom. per lb. (home)
Carbide, 4-cwt. lots .. .. £37 6s. 3d. d/d per ton
Ferro-manganese, home .. .. £54 15s. 0d. per ton
Manganese Ore Indian c.i.f. Europe (46%-48%) .. .. .. 70d./75d. per unit nom.
Brass Wire .. .. 2s. 6d. per lb. basis
Brass Tubes, solid drawn .. 1s. 10½d. per lb. basis

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Markets again enjoyed boom conditions during the past week. Trading remained at a high level despite the holiday period. Gilt-edged were strong and the Walsall Loan was a marked success. Last week the overall revenue surplus was £13,800,000 against £19,600,000 a year ago. The cumulative deficit is, however, still some £45,000,000 less than last year.

Kaffirs stole all the thunder among mining shares. Here also near boom conditions prevailed. Last month's returns, while not startling in themselves, disclosed a definite trend towards reduced costs and considerable increased output. The labour force while showing a small seasonable decline is also still well above last year's figure. Markets at the close of dealings for the old account on Tuesday were strong and very sharp advances were recorded by leading issues on Wednesday.

The finance house group all recorded good gains. These were particularly noticeable in the case of companies in the Anglo American circuit, many of which are interested in developing mines in the Orange Free State and Far West Rand. In the latter case, West Rand Investment Trust were outstanding. Apart from this, Johannesburg Consolidated gained ground following the big jump in Randfontein.

Among individual Rand mines, rises also occurred although these were much less spectacular. Indeed, some of the slower moving shares fell, probably due to switching to more active counters elsewhere. Apart from Randfontein already mentioned, interest was centred mainly on West Rand issues, such as Stilfontein, Western Reefs and West Driefonteins. Exceptionally, Rose Deep also attracted buyers due to statistical calculations of the possible break-up value of this old property over the next few years.

As has recently been the case, the Orange Free State attracted the preponderance of buying. Ofsits as the trust interested in properties with the best possibilities, were the star turn. Free State Geduld easily broke through the £5 level and Harmony, President Brand and Western Holdings all went ahead strongly. President Brand started operations and high gold values are expected. Many of the remaining popular issues also recorded good advances. Considerable speculative demand for Loraine developed.

West Africans were quiet but there was a better tone. Bremang rose from the recent very low level after the chairman's statement at the meeting. He hopes that the recent improvement will be maintained during the rest of the year.

West Australians, helped by the renewed general interest in gold shares, moved upwards. Gold Mines of Kalgoorlie were the best feature.

Diamonds, where changed, were the turn harder, with the exception of De Beers Deferred which jumped due to the company's Orange Free State interests and the go-ahead report of the Anglo Diamond Corporation in which Anglo American are interested.

Coppers were all lower mainly on account of continued profit-taking after the recent rise and switching into the more active Kaffir market. Esperanza fell due to the water supply difficulties and Cypriot political troubles. Exceptionally in this group, Rio Tinto were firm. Recently, a brokers' circular attracted considerable interest. This attempted to calculate Rio Tinto's asset value which was considered to be very substantially higher than the present market price.

Both Eastern and Nigerian tin markets were quiet but the 15 per cent interim dividend paid by Pengkalen caused a rise in the share price and Amalgamated Tin also gained the turn on further consideration of the latest returns.

Lead/Zinc shares were neglected and North Broken Hill shed a fair proportion of recent gains.

Among miscellaneous base metal shares, manganese issues were good and Consolidated Murchison again rose on Cape demand.

FINANCE	Price Aug. 11	+ or — on week
African & European	2 49/64	+ 1/4
Anglo American Corpn.	8 1/16	+ 1/16
Anglo-French	21/3	.....
Anglo Transvaal Consol.	23/9	.....
Central Mining (£1 shrs.)	38/3	+ 3/9
Consolidated Goldfields	51/6	+ 1/6
Consol. Mines Selection	37/3	— 3d
East Rand Consols	3/4 1/2	+ 4 1/2d
General Mining	4 1/2	+ 1/2
H.E. Prop. 5/- Shares	10/-	+ 6d
Henderson's Transvaal	7/-	+ 3d
Johnnies	50/- XD	+ 1/10 1/2
Rand Mines	3 1/8	+ 1/8
Rand Selection	45/-	+ 2/6
Strathmore Consol.	41/10 1/2	+ 3/11 1/2
Union Corp. (2/6 units)	42/6	+ 1/9
Vereeniging Estates	4 7/16	.....
Writs	40/-	+ 3/6
West Wits	40/-	.....
RAND GOLD		
Blyvoors	34/3	+ 9d
Brakpan	7/4 1/2	.....
City Deep	15/-	+ 3d
Consol. Main Reef	20/6	+ 1/9
Crown	41/3	.....
Daggas	71/10 1/2	+ 7 1/2d
Doornfontein	24/6	+ 3d
Durban Deep	31/3	+ 1/3
E. Daggas	10/6	+ 3d
E. Geduld .. (4/- units)	27/6	+ 9d
E. Rand Props	2 1/2	+ 1/2
Geduld	3 3/16	+ 1/16
Govt. Areas	13/3	+ 2/6
Grootvlei	19/-	+ 1/3
Libanon	10/-	— 3d
Luipaards Vlei	20/6	+ 3d
Marievale	18/6	+ 1/-
Modderfontein East	15/-	+ 7 1/2d
New Kleinfontein	12/6	+ 6d
New Pioneer	16/-	+ 2/9
Randfontein	70/-	+ 7/9
Robinson Deep	17/-	— 6d
Rose Deep	13/9	+ 1/3
Simmer & Jack	3/6	.....
S.A. Lands	19/4 1/2	— 1/7 1/2
Springs	3/3	.....
Stilfontein	30/9	+ 2/3
Sub Nigel	38/1 1/2	— 7 1/2d
Van Dyk	3/6	— 3d
Venterspost	11/6	— 3d
Vlakfontein	14/1 1/2	+ 1 1/2d
Vogelstruisbult	36/3	+ 6d
West Driefontein	5 39/64	+ 1/32
W. Rand Consolidated	51/10 1/2	+ 1/10 1/2
Western Reefs	50/7 1/2	+ 2/10 1/2

O.F.S.	Price Aug. 11	+ or — on week
Freddies	5/9	.....
Freddies Consolidated	19/6	— 6d
F. S. Geduld	5 7/32	+ 1/16
Geoffries	15/3	+ 2/-
Harmony	40/-	+ 4/-
Loraine	14/3	+ 2/9
Lydenburg Estates	18/6	+ 1/9
Merriespruit	11/9	+ 7 1/2d
Middle Wits	15/7 1/2	+ 1/11 1/2
Ofsits	73/-	+ 10/-
President Brand	70/-	+ 5/-
President Steyn	35/9	+ 1/3
St. Helena	26/9	+ 1/11 1/2
Virginia Ord.	15/3	+ 1/11 1/2
Welkom	21/6	+ 7 1/2d
Western Holdings	4 3/32	+ 3/32
WEST AFRICAN GOLD		
Amalgamated Banket	1/4 1/2	+ 1 1/2d
Ariston	6/1 1/2	— 1 1/2d
Ashanti	19/3	+ 3d
Bibiani	4/7 1/2	+ 3d
Bremang	1/9	+ 4 1/2d
G.C. Main Reef	3/3 XD	+ 1 1/2d
Konongo	2/4 1/2	.....
Lyndhurst Deep	10 1/2d	.....
Marlu	1/-	.....
Taquah & Abosso	1/9	.....
W. Selection & Dev.	6/1 1/2	+ 1 1/2d
AUSTRALIAN GOLD		
Boulder Perseverance	7/3 XD	.....
Gold Mines of Kalgoorlie	15/9	+ 1/-
Great Boulder Prop.	9/10 1/2	+ 7 1/2d
Lake View and Star	15/6	— 1 1/2d
Mount Morgan	18/6	+ 3d
North Kalgurli	8/1 1/2	— 4 1/2d
Sons of Gwalia	6/6	— 3d
Western Mining	15/- XD	+ 6d
MISCELLANEOUS GOLD		
Cam and Motor	8/10 1/2	+ 3d
Champion Reef	4/9	— 3d
Falcon Mines	7/9	.....
Globe & Phoenix	24/-	.....
G.F. Rhodesian	5/7 1/2	+ 3d
London & Rhodesian	4/4 1/2	.....
Motapa	2/1 1/2	+ 9d
Mysore	5/4 1/2	— 1 1/2d
Nundydroog	6/6	— 3d
Ooregum	4/-	— 1 1/2d

MISCELLANEOUS GOLD (contd.)	Price Aug. 11	+ or — on week
St. John d'el Rey	16/9	.....
Zams	37/9	— 3d
DIAMONDS & PLATINUM		
Anglo American Inv.	6 1/2	+ 1/32
Casts	27/-	+ 9d
Cons. Diam. of S.W.A.	6 5/16	.....
De Beers Defd. Bearer	5 5/8	+ 1/8
De Beers Pfd. Bearer	17	— 3/8
Pots Platinum	10/-	.....
Watervaal	16/6	+ 9d
COPPER		
Chartered	80/6	— 1/9
Esperanza	5/4 1/2	— 4 1/2d
Indian Copper	4/9 XD	+ 3d
Messina	4 1/16	— 1/8
Nchanga	9	— 1/16
Rhod. Anglo-American	70/-	— 3/9
Rhod. Katanga	12/-	— 9d
Rhodesian Selection	19/3	— 1/-
Rhokana	25 1/4	— 1/4
Rio Tinto	35 1/4	+ 1 1/4
Roan Antelope	19/-	— 3d
Selection Trust	43/1 1/2	.....
Tanks	4 49/32	— 5/32
Tharsis Sulphur Br.	3 1/2	+ 1/4
TIN (Eastern)		
Ayer Hitam	27/-	+ 9d
Gopeng	8/-	.....
Hongkong	7/7 1/2	— 3d
Ipoh	16/6	.....
Kamunting	8/1 1/2	.....
Kepong Dredging	3/9	.....
Kinta Tin Mines	10/3	.....
Malayan Dredging	27/3	.....
Pahang	11/6	— 3d
Pengkalen	9/- XD	.....
Petaling	7/7 1/2 XD	— 1 1/2d
Rambutan	17/3	— 6d
Siamese Tin	6/10 1/2	.....
Southern Kinta	17/-	— 4 1/2d
S. Malayan	25/-	.....
S. Tronoh	9/6	— 3d
Sungei Kinta	10/9	.....
Tekka Taiping	5/4 1/2 XD	— 4 1/2d
Tronoh	24/9	.....
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	14/9	+ 1 1/2d
Beralt Tin	25/3	— 6d
Bisichi	6/1 1/2	.....
British Tin Inv.	15/3 XD	— 1 1/2
Ex-Lands Nigeria	3/1 1/2	+ 1 1/2d

TIN (Nigerian and Miscellaneous) contd.	Price Aug. 11	+ or — on week
Geevor Tin	11/9	.....
Gold & Base Metal	2/10 1/2	— 1 1/2d
Jantar Nigeria	9/-	— 1 1/2d
Jos Tin Area	13/7 1/2	+ 4 1/2d
Kaduna Prospectors	2/3	.....
Kaduna Syndicate	2/6	.....
London Tin	6/1 1/2	.....
United Tin	3/3	.....
SILVER, LEAD, ZINC		
Broken Hill South	50/6	— 3d
Burma Mines	2/3	.....
Consol. Zinc	34/3	.....
Lake George	6/9	.....
Mount Isa	44/6 XD	— 6d
New Broken Hill	28/-	+ 6d
North Broken Hill	64/-	— 4/3
Rhodesian Broken Hill	10/1 1/2	— 1 1/2d
San Francisco Mines	18/-	+ 9d
Uruwira	3/7 1/2	— 4 1/2d
MISCELLANEOUS		
BASE METALS & COAL		
Amal. Collieries of S.A.	45/7 1/2	— 7 1/2d
Associated Manganese	47/9	+ 1/-
Cape Asbestos	24/6	— 3d
C.P. Manganese	42/-	+ 1/3
Consol. Murchison	54/7 1/2	+ 1/10 1/2
Mashaba	7 1/2	.....
Natal Navigation	3 1/16	.....
Rhod. Monteleo	1/3	.....
Turner & Newall	86/6	+ 1/3
Wankie	14/9	— 4 1/2d
Witbank Colliery	4 1/16	.....
CANADIAN MINES		
Dome	$28 1/4	— 2
Hollinger	$34	.....
Hudson Bay Mining	$86	+ 1
International Nickel	$80	— 1
Mining Corpn. of Canada	£5 1/8	.....
Noranda	$135	.....
Quemont	£7	+ 1/8
Yukon	3/9	.....
OIL		
Anglo-Iranian	16 1/8	+ 3 1/16
Apex	53/9	— 3d
Attock	50/7 1/2	+ 2/1 1/2
Burmah	99/4 1/2	+ 18/10 1/2
Canadian Eagle	33/-	+ 6d
Mexican Eagle	18/4 1/2	+ 7 1/2d
Shell (bearer)	£ 5/16	+ 1/16
Trinidad Leasehold	23/9	+ 3d
T.P.D.	22/9	+ 3d
Ultramar	28/6	+ 6d

COMPANY NEWS AND VIEWS

Rand and O.F.S. July Returns

Following the advent as a producing mine of President Steyn weeks ago, President Brand, its westerly neighbour, has now made its eagerly awaited entry to the list of producers. Apart, therefore, from F.S. Geduld, on which so many hopes have been built, the centre block of O.F.S. Mines which holds, perhaps, greater promise than any other gold area in South Africa, has now successfully reached the production stage.

President Brand, which is to start its producing life with an initial milling rate of 75,000 tons monthly commenced its preliminary crushing operations in March this year and has, therefore, undoubtedly, during the last four months already obtained a substantial amount of gold. It should, therefore, be borne in mind when initial returns are received next month, that the figures will include a proportion of these preliminary costs and profits and figures will consequently not become representative for a month or so. Nevertheless, there is no doubt that the excellent development results achieved at this mine indicate a mill grade far in excess of that obtained by other producing mines in the O.F.S. In fact, discounting the possibility of considerable amounts of low grade development rocks being sent initially to the mill, a figure of 20 dwt. per ton is well within the realm of possibility. On the other hand, it is likely that a conservative start will be made before launching directly into the high potential values which must, however, sooner or later appear at the mill head.

Company	July, 1954 Tons (000)	Yield (oz.)	Profit (£000)	Yr. ends	Current Financial Year Total to date Tons (000)	Yield (oz.)	Profit (£000)	Last Financial Year Total to date Tons (000)	Yield (oz.)	Profit (£000)
Gold Fields										
Doornfontein	50	16,250	77·9	J	50	16,250	77·9	—	—	—
Libanon	97	20,130	50·3	J	97	20,130	50·3	83	16,810	41·9
Luipaards Vlei	110	21,738	45·4	J	110	21,738	45·4	108	20,037	44.8
Rietfontein	28	6,309	23·1	D	194	43,582	167·2	186	41,588	177·7
Robinson	106	22,366	26·4	D	686	164,191	167·1	679	131,234	91·8
Simmer & Jack	127	20,323	12·0	D	883	142,205	76·5	848	37,838	89·1
Sub Nigel	67	21,912	95·3	J	67	21,912	95·3	67	22,278	103·9
Venterspost	108	26,228	60·8	J	108	26,228	60·8	103	24,154	55·6
Vlakfontein	39	13,900	70·3	D	269	95,920	496·2	254	92,605	495·1
Vogels	103	26,209	109·8	D	716	181,241	758·5	673	170,468	682·3
West Drie	52	38,970	303·5	J	52	38,970	303·5	42	27,793	233·5
Anglo American										
Brakpan	111	18,342	10·1	D	775	130,705	94·4	801	143,415	150·0
Daggas	230	52,975	326·3	D	1541	358,313	2200·5	1537	362,715	2342·2
East Daggas	94	15,912	46·4	D	652	110,767	323·0	630	109,860	337·8
President Steyn	47	13,084	30·0	D	156	41,069	53·3	—	—	—
S.A. Lands	101	18,561	53·6	D	699	128,515	375·8	699	127,277	357·1
Springs	130	18,144	7·0	D	906	126,935	53·2	1035	142,601	75·3
Welkom	77	15,128	10·0	D	490	97,309	21·9	427	85,160	113·9
Western Hldgs.*	51	17,987	85·0	D	323	109,449	373.6	33	8,414	5·0
West. Reef Ex.	118	23,014	65·4	D	804	158,698	455·0	757	155,602	566·2
Central Mining										
Blyvoor	111	63,203	493·3	J	111	63,203	493·3	105	62,234	519·2
City Deep	168	32,317	14·0	D	1144	218,222	116·4	1112	215,409	159.9
Cons. M. R.	189	26,161	34·5	J	189	26,161	34·5	176	24,208	19·6
Crown	312	48,729	52·6	D	1969	312,638	341·4	1863	297,760	267·3
D. Roodepoort	188	30,915	52·1	D	1228	203,680	310.9	1246	211,962	479.7
East Rand Prop.	225	49,327	135·2	D	1397	316,553	838·7	1313	287,893	732·8
Modder B.	58	6,145	2.6	D	394	41,385	18·0	379	40,754	17·5
Modder East	121	13,789	11·0	J	121	13,789	11.0	125	14,086	18·0
Rose Deep	76	11,097	11·4	D	492	75,097	84·5	516	76,398	54.1
Welgedacht	34	3,968	1·7	J	34	3,968	1·7	35	4,326	4·0
J C.I.*										
E. Champ d'Or‡	23	2,097	5·0	D	164	16,105	47·4	170	27,422	9·7
Freddies Cons.	86	14,987	L23·4	D	522	88,690	L135·0	22	3,158	L25.5
Govt. G.M.A.	272	†35,191	†32·3	D	1817	235,376	212·4	1708	233,299	400·6
Randfontein‡	287	36,790	45·1	D	2005	266,533	147·8	2143	275,065	191·9
Union										
East Geduld	144	44,283	323·9	D	940	289,033	2106·2	951	285,297	2123·3
Geduld Prop.	99	16,105	33·2	D	642	104,627	184·4	669	105,649	2[illegible]7·7
Grootvlei	190	40,379	226·0	D	1257	267,536	1494·9	1288	274,750	1619·6
Marievale	69	17,633	79·5	D	452	115,059	501·4	437	106,963	465·8
St. Helena	91	20,242	60·6	D	562	124,179	357·3	439	87,532	138·4
Van Dyke	81	13,769	1·1	D	550	95,096	12·8	620	100,185	15·5
General Mining										
S. Roodepoort	29	6,142	21·0	J	29	6,142	21·0	29	6,160	20·8
W. Rand Cons.§	240	31,525	201·9	D	1571	196,047	1276·9	1566	219,695	632·2
Anglo Transvaal										
N. Klerksdorp	11	1,333	L 1·5	D	79	5,424	L 8·8	72	9,879	8·0
Rand Leases	184	30,913	40·1	J	184	30,913	40·1	160	27,442	12·3
Village M.R.	35	5,260	11·5	J	35	5,260	11·5	34	5,295	12·3
Others										
Ellaton Gld Mng	28	9,281	53·7	D	183	51,867	230·1	—	—	—
N. Kleinfontein	110	13,555	13·1	D	753	93,736	105·7	744	96,394	102·3
Nigel Gold	29	4,579	8·5	D	195	29,994	L 1.0	221	30,965	L 6.4
Spaarwater	11	2,750	0·6	D	74	18,642	1·1	72	16,579	L 23.1
Stilfontein	86	31,172	192·2	D	570	190,486	1084·2	433	123,568	598·5
W. Nigel	18	3,886	9·5	J	18	3,886	9·5	17	3,831	6·0

* Production started in July 1953 ‡ Gold and Uranium
† Gold and Pyrite § Including £185,000 from uranium. L indicates loss

General Mining—Strathmore Deal

It is announced by the General Mining and Finance Corporation in a circular to shareholders that an extraordinary general meeting will be held at Johannesburg on August 31 to consider the proposed merger of the corporation with Strathmore Consolidated Investments. This, it is proposed, will be affected by the offer of one £1 General Mining share for every two Strathmore 5s. shares of which there are a total of 1,365,000 in issue.

Under this scheme the nominal capital of the corporation would be increased from £3,750,000 to £4,250,000 by the creation of 500,000 £1 "S" ordinary new shares which will not rank for dividend in respect of the year to December 31 next. Of these new shares the Anglo American Corporation has agreed to take up 199,108 units for a price of £822,500 which sum will then be utilized by General Mining to procure a portfolio of securities at current market prices from the latter corporation.

In the event of this proposal being authorized by shareholders the corporation's interests will be substantially extended. In addition, however, the corporation will become responsible for the administration of the following companies: Stilfontein G.M. Co., Ellaton G.M. Co., Bullelsfontein G.M. Co., New Pioneer Central Rand G.M. Co., Eastern Rand Extensions, Southern Van Ryn Reef G.M. Co., Alpha Free State Holdings and Babrosco Mines (Pty.).

There could be many motives for the merging of these two companies but, undoubtedly, the main reason is that General Mining saw the opportunity of fattening its gold portfolios and at the same time taking very substantial interest in uranium. Indeed, if this deal is approved, the activities of the corporation will have changed considerably for, due to investment activities in the industrial field during recent years, General Mining could be said to have departed somewhat from its original role. In fact, with only two mines under its direct administration, the corporation could not really have been described as one of the large mining finance houses.

Now that these valuable properties have come into its orbit, however, the corporation emerges as the most important group identified with the Far West Rand. Furthermore, on present indications, the timing of this deal might well prove to have coincided with the long overdue renewal of the South African gold share market.

Terms of Anglo-Iranian's Persian Agreement

The prolonged negotiations, in the first place, regarding compensation to the Anglo-Iranian Oil Co. for losses incurred since 1951 together with the value of their oil assets in Northern Persia, and secondly, for the future joint operation of the Persian wells and refinery were brought to a satisfactory close at Terhan last week where agreement was reached between the Iranian Government and the international consortium of oil companies.

Compensation, the announcement states, will amount to £25,000,000 which will be paid by the Persian Government in ten equal annual instalments commencing on January 1, 1957. It is stressed that in accepting this offer, which is considerably below the amount originally envisaged, the Anglo-Iranian Oil Company has had regard to its continuing interest in the oil operations in South Iran; to the payments made to it by other members of the consortium; and to its sincere desire to reach a solution of the dispute.

Agreement in principle was also reached over the practical arrangements under which the flow of Iranian oil will be restored in world markets. Accordingly, the consortium, which consists of Anglo-Iranian, Compagnie Francaise des Petroles, Gulf Oil, Royal Dutch, Shell, Socony-Vacuum, Standard Oil of California, and the Texas Company, is to have the use of the installations in South Iran for a period of 25 years with three five-year options of renewal.

With regard to the financial arrangements adopted, however, Anglo-Iranian will have the largest single share in the consortium's participation amounting to 40 per cent. In common with other Middle East oil producing countries, the financial agreement was drawn up to provide for a profit-sharing scheme whereby the Persian Government will in future obtain a 50 per cent participation.

An undertaking has also been entered into by the consortium under which production will be rapidly increased and during the first three-year period will amount to 68,000,000 tons of refined and crude oil.

American Metal Maintains Quarterly Dividend

In comparison with the total consolidated income of $4,385,126 earned by the American Metal Company during the June quarter of 1953, the amount of $3,092,305 in respect of income for the same quarter of the current year represented a considerable fall. Net earnings on the corporation's 2,979,167 common shares accordingly declined to 46 c. as compared with 73 c. previously.

At the first sight, therefore, there would appear to have been a serious adverse change from last year, however, due to the different dates of dividend receipts between the two years it is apparent that this is not the case. Most important amongst these receipts are dividends from Roan Antelope Copper Mines and Rhodesian Selection Trust in which American Metal holds about 32½ per cent directly in the former and about the same percentage indirectly through R.S.T. in the latter.

When, therefore, the figures for the first half of the current financial year are compared with those of the same period for the previous year it is revealed that although total income is down by $1,797,222 to $5,752,372 from $7,549,594 it must be noted that this total does not include dividends of $1,690,000 already declared from Northern Rhodesia which do not become payable until the third quarter of 1954. Last year these dividends amounted to $1,189,000 and were received during the first half of 1953. Against this, however, a payment from the San Francisco Mines of Mexico amounting to $478,000 during the current year has already been received while no payment was taken in from this source last year until the third quarter when $717,000 was received.

Present indications are therefore that dividend income at the end of the third quarter of 1954 should show an increase over that of the corresponding period of last year.

Wolverhampton Metal Maintains Profits

Against a background of declining profits in the metal industry as a whole during the year to March 31, 1954, and the uncertainty surrounding metal prices following the re-opening of the London Metal Exchange, it is of particular note that the Wolverhampton Metal Company has been able to maintain its profits at a level virtually unchanged from that of the previous year. Group production, however, failed to reach last year's heights but there was a reasonably good demand for the company's output of non-ferrous ingots, cathode copper, etc.

Year to Mar. 31	*Trading Profit**	*Taxation*	*Net Profit*	*Dividend*	*To Reserve*	*Carry Forward*
	£	£	£	£	£	£
1954	447,499	219,853	150,166	59,593	75,000	282,401
1953	473,289	233,160	159,019	58,049	Nil	266,828

* Before depreciation £50,628 (1953 - £27,688) and directors and auditor remuneration of £24,852 (1953 - £23,369).

Dividends amounting to 27½ per cent, the same as for last year, were paid on the company's issued ordinary capital of £1,576,000 in ordinary stock units of 5s. each.

In his statement to shareholders, Mr. T. C. James, the chairman, refers to the raw material supply position which continues to be difficult. Considerable benefit, however, is being obtained from the company's new plant and improved methods of treatment and concentration of the low grade residues and by-products which have been accumulated. Mr. James takes an encouraging view of the future—"although the sellers' markets has now gone in its place we have a sounder, if less profitable, basis of a buyers' market." And while recent changes in trading conditions have naturally brought serious price cutting, there are now signs of a gradual improvement and the company's trading for the current financial year is up to expectation.

At a price of around 20s. 2d. a yield of about 6.6 per cent is at present attainable on the 5s. ordinary shares of the company. Meeting, Birmingham, August 31, 1954.

Mount Morgan's Profits Virtually Unchanged

A preliminary profit statement from Mount Morgan in respect of the year to June 26, 1954, disclosed that a net profit of £A440,645 was earned as compared with £A448,026 in the preceding period. With the recommendation of a final ordinary dividend of 10 per cent on the company's issued ordinary capital of £A1,400,000 in 10s. units, dividends for the year constituted a total of 20 per cent which was the same distribution as for the previous year.

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U-Tin and Ribon Valley's New Acquisition

It has been announced simultaneously by United Tin Areas of Nigeria and Ribon Valley (Nigeria) Tinfields that the entire issued share capital of Fobra Tin Limited has been acquired for £50,000. It is disclosed that Ribon Valley has participated in this deal as to an interest of one-third. In addition to plant and buildings etc., Fobra Tin owns tin and columbite areas in Northern Nigeria comprising 1,319 acres under mining lease titles and under application and 9.7 sq. miles under an exclusive prospecting licence. To date, the agreed estimate of proved columbite in terms of concentrates is 159 tons, and a further 288 tons are claimed. In addition, however, much ground of "probable value" still remains to be prospected and developed. It is also stated that present tin and columbite production will continue, there being existing contracts for columbite until January, 1957. Moreover, additional avenues for increased production appear favourable.

Four exclusive prospecting licences totalling 16 sq. miles adjoining the Fobra Area have also been applied for by the company. Prospecting results to date are very encouraging and already an appreciable tonnage of columbite has been disclosed. An option is also held over an additional 101 acres of mining leases and 9 sq. miles under exclusive prospecting licence. It is the intention of the company to examine these additional areas as soon as possible and it is thought that, if proved satisfactory, they will provide a compact, easily manageable, area with excellent prospects for economic tin and columbite production.

Production by United Tin in respect of the year ended June 30, 1954, was 93 tons of tin concentrates and 1,375 s.tons of columbite concentrates; this compares with 130 tons and 16.05 respectively for the previous financial year. Ribon Valley's production for the financial year to March 31, 1954, was 121 tons of tin concentrates as compared with 116 tons last year.

The Rhodesia and Nyasaland Luncheon Club

The foundation of a luncheon club in London, primarily for the purpose of entertaining distinguished visitors from the Central African Federation to the U.K., was announced this week.

The circular setting out the details points out that now that the Federation of Rhodesia and Nyasaland has become a reality it has been considered desirable that an organization should be set up in London to enable friends of the Federation to entertain distinguished visitors to the United Kingdom. The idea is to have a simple association of firms and individuals and it is not proposed, at any rate to begin with, to have any fixed subscription; those attending a function would pay for their tickets an amount estimated to be sufficient to defray the cost of the function.

At a later stage it will be desirable to call a meeting of all members to adopt a formal constitution and to elect a full committee but meanwhile, in order to get things started, the following have agreed to serve on a small temporary committee: Sir Douglas Malcolm (Chairman), Mr. C. Hely-Hutchinson, Mr. Julian Crossley, Mr. C. R. Hill, Mr. J. B. Ross, and Mr. E. D. Hawksley (Hon. Secretary).

The British South Africa Company has undertaken for the time being, to administer the scheme and to arrange for the meeting of any small outgoings which may be involved.

As it is unlikely that a representative gathering can be obtained during the summer holiday season, it is not proposed to hold the first luncheon before the autumn, when further details will be issued.

Anglo-Egyptian soon to resume Exploration

With the signing of the Ras Matarma lease, which has been agreed and awaits signature, progress will have been made towards a resumption of the exploration work by Anglo-Egyptian oilfields suspended since 1948. Before this can be put into operation, however, agreement in principal with the Government of Egypt regarding leases and licences (negotiations concerning which are now in progress) is necessary together with the adoption of the new price agreement which was signed recently. The promise of more stable trading conditions held out by this impending price agreement, however, will enable the company to go ahead with the modernization of their refinery which had previously been postponed. But this is only part of the "urgent" heavy capital expenditure programme which will be resumed when full agreement is reached.

BREMANG GOLD DREDGING

The seventeenth annual general meeting of the Bremang Gold Dredging Co., Ltd., was held on August 9 in London.

Major General W. W. Richards, C.B., C.B.E., M.C., Chairman of the Company, presided.

The following is an extract from his circulated Statement:—

The operating profit for 1953 was £88,581. After taking into account overprovision for Taxation in respect of previous years £14,673; £5,250 loss on the sale of investments; and transferring £98,125 to the Reserve Account for dredge removals, we carry forward as a credit on Profit and Loss Account the sum of £20,451. It will, I am sure, be a great disappointment to Members that we are not recommending the payment of a dividend on account of the year under review.

Due to delays in delivery of replacement equipment, the No. 2 Dredge took some six months longer to re-erect than had been originally anticipated and two dredges instead of one were for a period under transfer at the same time to the Extended Areas. As a consequence the cost of transferring the dredge and the loss of revenue have been heavy.

Nearly half a million pounds has been expended in plant, machinery, buildings, roads, etc., in connection with the project of transferring the dredges from the Ankobra River to the Offin River (Extended Areas). This has considerably reduced liquid resources and the financing of the project has only been made possible by temporary advances from the Company's Bankers.

After very careful consideration the Board have come to the conclusion that it would be imprudent to delay further the making of the adjustments necessary to give effect to the current financial position and a more realistic appreciation of the intrinsic value of the assets of the Company.

It is proposed to write the sum of 3s. off each of the issued 5s. Stock units; the unissued Shares of 5s. will then be converted into Shares of the nominal value of 2s. each; and the authorized Capital restored to the original amount of £1,250,000 and will be divided into £421,684 16s. 0d. issued and fully paid Stock (transferable in units of 2s.) and 8,283,152 unissued Shares of 2s. each. Under existing regulations, such restoration can be effected without payment of additional capital duty. It should be emphasized that the suggested reorganization of Capital does not in any way affect Members' rights in the equity of the Company.

The report and accounts were adopted and the Board's capital proposals were approved.

SOUTH AFRICAN WATER PURIFICATION PLANT TENDERS

Tenders have been invited for the supply of equipment for extensions to the Purification Plant of the Orange Free State Goldfields Water Supply Scheme at Balkfontein. This equipment comprises rapid gravity filters with a capacity of 32,000,000 galls. per day, lime-burning gas-fired plant with an output of about 80 tons of burnt lime per day and producing carbon dioxide gas for blowers carbonating 48,000,000 galls. of water per day, lime crushers, belt conveyors, dosing and slaking plant, and raw water Venturi flumes and chloride and alum dosing plant to treat 48,000,000 galls. per day.

The closing date for the tenders is September 9, 1954. A copy of the tender documents may be obtained from the office of the Director of Irrigation, Central Government Office, Church Street, Pretoria, on payment of a deposit of £50.

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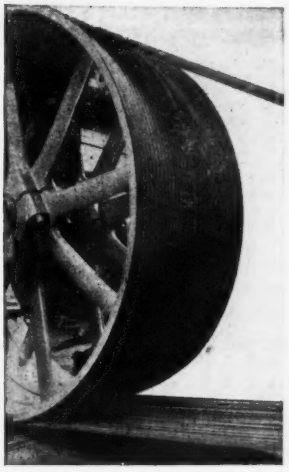

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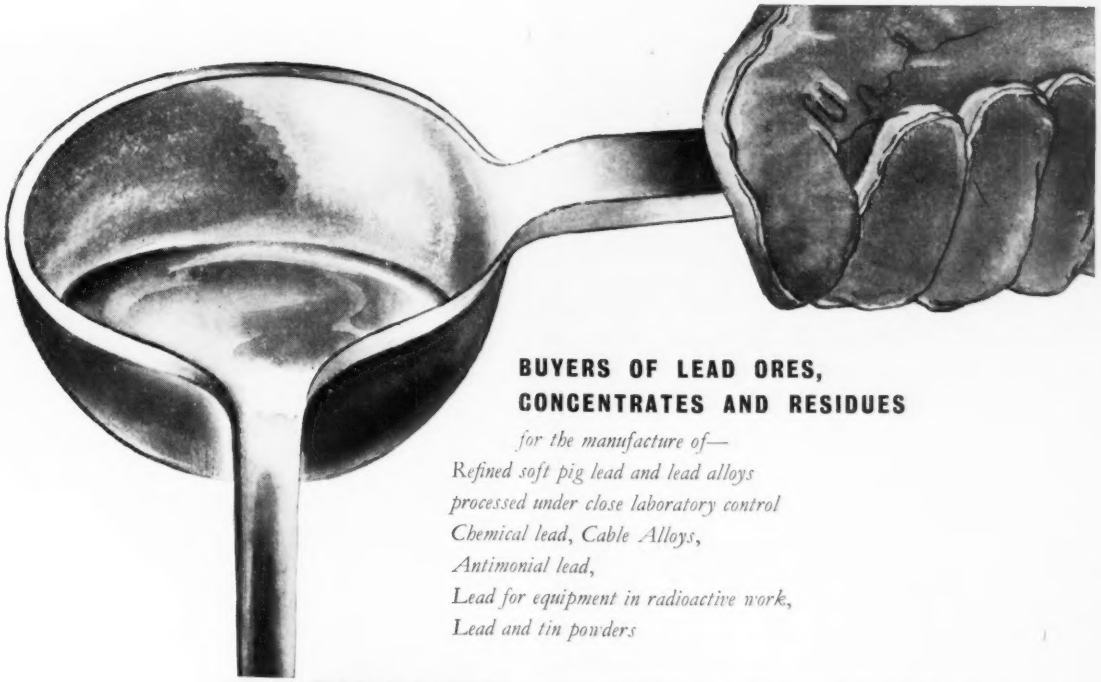

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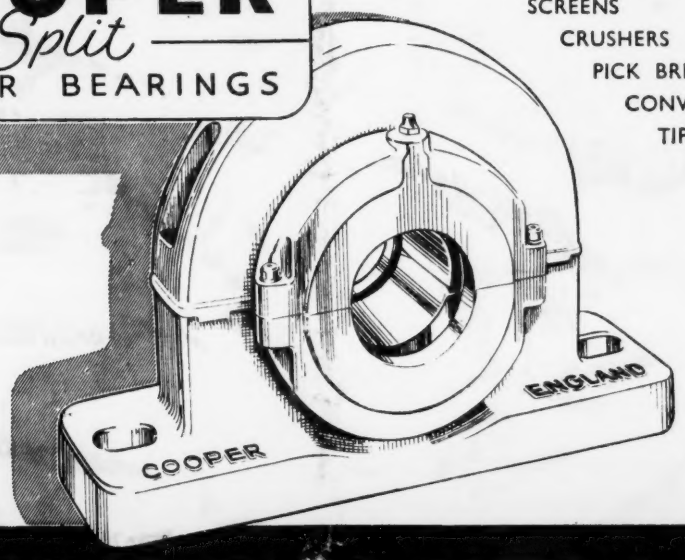

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